United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

No. 11,131

JOINT APPENDIX

United States Court of Appeals

For the District of Columbia Circuit

Thomas F. Peterson, *Appellant*,

v.

John A. Marzall, Commissioner of Patents, *Appellee*.

577

Appeal from the United States District Court for the District of Columbia

Wilson - Epes Printing Co. - RE 6003 - Washington 1, D. C.

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United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

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THOMAS F. PETERSON, *Appellant*,

v.

JOHN A. MARZALL, Commissioner of Patents, *Appellee*.

Appeal from the United States District Court for the District of Columbia

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JOINT APPENDIX

65 Filed Oct 12 1949 Harry M. Hull, Clerk

IN THE
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

THOMAS F. PETERSON,
23450 Laureldale Road,
Shaker Heights, Ohio
Plaintiff

vs.

LAWRENCE C. KINGSLAND,
Commissioner of Patents,
Washington, D. C.
Defendant

Civil Action No. 4362—'49

Complaint

To the Honorable Judges of the District Court of the United States for the District of Columbia:

The plaintiff, for this complaint, alleges:

1.

The jurisdiction of this Court depends upon the statutes of the United States relating to the grant and issuance of Letters Patent of the United States, and particularly upon that section thereof known as Sec. 4915 R. S.; U. S. C. Title 35, Sec. 63.

2.

Plaintiff, Thomas F. Peterson, is a citizen of the United States, residing at 23450 Laureldale Road, Shaker Heights, Ohio.

3.

Defendant, Lawrence C. Kingsland, is the Commissioner of Patents of the United States, whose official
residence as Commissioner of Patents is in the
66 District of Columbia, and he is sued as Commissioner of Patents of the United States.

4.

Plaintiff did invent certain new and useful improvements in non-static structures, for which invention, an application for Letters Patent of the United States was filed in the Patent Office on November 13, 1943, entitled "NON-STATIC STRUCTURES", which application was given the Serial No. 510,256.

5.

The said application was filed and has been duly prosecuted in accordance with the Laws of the United States and the Rules of Practice of the Patent Office.

6.

A patent on the said application has been refused by the Commissioner of Patents, defendant herein.

7.

The invention involved in this proceeding relates to an electrically insulating layer structure, such as a floor rug, that is subject to frictional generation of static charges by a body moving over an exposed surface, and made non-static in effect by a combination with a second layer of semi-conductivity coextensively contacting the non-exposed surface of the insulating layer and preventing any material increase in potential difference between a charge generated in the rug (or other insulating structure) and its opposite charge on the generating body upon lateral separation of the two charges; the semi-conductivity of the second layer also insures against accidental conductance of harmful currents.

67 8.

The said application has been passed upon by the primary Examiner who has refused to allow any of the claims and who finally rejected the following claims:

21. Non-static floor covering comprising in combination a flexible layer electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving in a lateral direction thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the lateral movement of the body, and a second layer of semi-conductivity in substantially coextensive contact with the non-exposed surface of the textile layer providing for induced charge leakage in the line of lateral movement of the body to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

22. Non-static structure comprising in combination a layer of flexible material electrically non-conductive laterally and in depth, said layer being exopsed on one surface to frictional static-engendering contact by a body moving relative thereto and thereby creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the relative movement, and a second layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the flexible layer providing for incuded charged leakage laterally in the direction of the movement to prevent substantial

increase in the potential between the charges, the semiconductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

23. Non-static structure comprising in combination a layer of material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body to thereby create an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by a relative movement, and a second non-metallic layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the layer providing for induced charge leakage laterally in the line of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

68 9.

From the decision of the primary Examiner, an appeal was taken to the Board of Appeals of the United States Patent Office which affirmed the rejection of the primary Examiner in its decision dated April 14, 1949, and in a second decision dated June 16, 1949, made upon a request for reconsideration submitting in conjunction therewith affidavit by a qualified expert setting out facts believed material to the decision, which affidavit was refused consideration; no appeal has been taken to the United States Court of Customs and Patent Appeal from said decisions.

10.

The invention is new and useful, and was not known or used by others in this country before the invention thereof by the plaintiff, and was not patented or described in any printed publication in this or any foreign country before the invention thereof by plaintiff or more than one year prior to his said application for patent therefor, and was not in public use or on sale in the United States for more than one year prior to said application, and was not patented in any country foreign to the United States on an application filed by plaintiff or his legal representatives or assigns more than twelve months prior to said application for United States Letters Patent, and has not been abandoned.

WHEREFORE, the plaintiff prays this Honorable Court;

1. To adjudge that plaintiff is entitled according to law to receive Letters Patent of the United States 69 for the aforesaid invention as defined in claims 21, 22 and 23, hereinbefore recited.

2. To decree that the Commissioner of Patents be directed to allow the aforesaid claims 21, 22 and 23, and such other claims as upon hearing the court may find patentable and to issue to plaintiff United States Letters Patent containing the said claims.

3. To afford such other and further relief as the nature of the case may require.

THOMAS F. PETERSON

By /s/ Joseph N. Nielsen
Joseph N. Nielsen

/s/ Patrick Henry Hume
Patrick Henry Hume
Attorneys for Plaintiff,
1025 Connecticut Avenue,
Washington, D. C.
Telephone: Sterling 1937

• • • •

70 Filed Oct 22 1949 Harry M. Hull, Clerk

Answer to the Complaint

To the Honorable the Judges of the United States
District Court for the District of Columbia.

1, 2, 3. The defendant admits the allegations of paragraphs 1, 2, and 3 of the complaint.

4. He admits the filing of the application referred to in paragraph 4. He denies for reasons hereinafter given that the said application discloses any such invention by plaintiff as would justify the allowance of a patent containing any of the claims set forth in the complaint.

5, 6, 7, 8, 9. He admits the allegations of para-
71 graphs 5 to 9, inclusive, of the complaint.

10. He denies the allegations of paragraph 10 of the complaint.

FURTHER ANSWERING, the defendant states that the plaintiff is not entitled to a patent containing any of the claims set forth in the complaint for the reasons given in the Statement of the Primary Examiner in answer to the plaintiff's appeal, in the Examiner's Reply to plaintiff's brief, in the decisions of the Board of Appeals and in view of the following references:

Ayrton et al	546,802	Sept. 24, 1895
British patent	541,169	Nov. 14, 1941

Profert of copies of said statement, reply, decisions and references is hereby made.

Respectfully submitted,

/s/ E. L. Reynolds
Solicitor, U. S. Patent Office,
Attorney for Defendant.

* * * *

72 Filed Dec 7 1949 Harry M. Hull, Clerk

Order

Upon consideration of the fact that John A. Marzall succeeded to the office of Commissioner of Patents on December 2, 1949, in place of Lawrence C. Kingsland, who resigned, and it appearing that there is substantial need for continuing and maintaining the above-entitled action, now therefore it is this 7th day of December 1949

ORDERED that John A. Marzall, Commissioner of Patents be and he is hereby substituted as party defendant in place of Lawrence C. Kingsland, formerly Commissioner of Patents.

/s/ H. A. Schweinhaut
Judge.

* * * *

73 Filed Apr 25 1951 Harry M. Hull, Clerk

Memorandum of Court

This is a proceeding under Section 4915 of the Revised Statutes (United States Code, Title 35, Section 63.)

Plaintiff has filed this action to compel the issuance to him of letters patent covering "non-static structures".

It appears that on November 13, 1943, plaintiff filed in the United States Patent Office application for such patent, the application being given Serial No. 510,256.

The invention relates to a conductive coating which is placed on a surface on a body of insulation whereby the generation of static electricity by frictional contact with the body is prevented.

The Primary Examiner refused to allow any of the claims, and finally rejected Claims 21, 22 and 23, which read as follows:

21. Non-static floor covering comprising in combination a flexible layer electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving in a lateral direction thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the lateral movement of the body, and a second layer of semi-conductivity in substantially coextensive contact with the non-exponsed surface of the textile layer providing for induced charge leakage in the line of lateral movement of the body to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

74 22. Non-static structure comprising in combination a layer of flexible material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving relative thereto and thereby creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the relative movement, and a second layer of semi-conductivity in substantial coextensive contact with the non-exponsed surface of the flexible layer providing for included charged leakage laterally in the direction of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second

layer being of a character to insure against accidental conductance of harmful current amperage.

23. Non-static structure comprising in combination a layer of material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body to thereby create an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by a relative movement, and a second non-metallic layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the layer providing for induced charge leakage laterally in the line of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

On April 14, 1949, the Board of Appeals of the Patent Office affirmed the rejection of Claims 21, 22 and 23 by the Primary Examiner, and on June 16, 1949 reaffirmed its decision. The claims were rejected on the basis of the Ayrton patent No. 546,802 and on British patent No. 541,169.

After careful consideration of the record and the testimony adduced at the hearing before the Court, the Court is of the opinion that the claims were properly rejected on the authority of the two patents referred to. The Court agrees with the conclusion of the Board of Appeals that: "Since it is old in the art to prevent the building up of static charges by direct electrical connection to a dissipative coating, as shown by the British patent, or by a capacitative coupling to a dissipating coating, as shown by Ayrton et al . . . it would not require the exercise of invention to select either method to prevent the accumulation of static charges generated on rugs or similar objects. The two methods are functionally equivalent."

75 Counsel will prepare findings of fact, conclusions of law and judgment, and submit the same to the Court on notice.

/s/ Walter M. Bastian
Judge

• • • •

76 Filed May 11 1951 Harry M. Hull, Clerk

Findings of Fact

1. This is an action under R. S. 4915 (35 U. S. C. 63) in which the plaintiff, Thomas F. Peterson, seeks to have the Court authorize the allowance of claims 21, 22, and 23 of his application Serial No. 510,256 for Non-Static Structures, which claims were refused by the Board of Appeals.

2. The plaintiff's application in suit discloses a non-static floor covering, such as a rug 10, with a fabric pile 12 and a semi-conducting sheet structure 13 between the floor and the pile of the rug.

3. The patent to Ayrton et al No. 546,802 relates to screening electrical or other instruments and 77 apparatus. The object is to shield the instrument from the effects of static charges produced on the glass, as by rubbing it when cleaning the glass. For the purpose indicated, a screen is used, which may be on the front of the glass, on the back of the glass, or, as in Fig. 4, between two pieces of glass. When the dissipative screen is on the back of the glass there is a capacitative coupling between the static charge on the front of the glass and the dissipating coating or screen on the back of the glass.

4. The British patent No. 541,169 relates to improvements in pile fabric floor coverings. It discloses a rug having on the back thereof a semi-conducting coating 5 of rubber with carbon black therein, there being conductors 4 extending to the surface of the pile to conduct electric charges to the layer 5. The device is said to act as a condenser, in that the layer 5 (page 2, lines 59 to 63) "functions as a condenser and has sufficiently great capacity to receive and then dissipate accumulation of static by leakage". Alternatively, the rug may be electrically grounded (page 2, lines 76 to 79) by electrically contacting with any conducting body.

5. Claims 21, 22, and 23 involve no invention over the disclosure of the British patent No. 541,169 in view of the Ayrton et al patent No. 546,802.

6. Since it is old in the art to prevent the building
up of static charges by direct electrical connection
78 to a dissipative coating, as shown by the British
patent, or by a capacitative coupling to a dissipating coating, as shown by Ayrton et al, it would not require the exercise of invention to select either method to prevent the accumulation of static charges generated on rugs or similar objects. The two methods are functionally equivalent.

7. None of the claims at bar defines any invention over the prior art.

Conclusions of Law

1. Plaintiff is not entitled to a patent containing any of claims 21, 22, or 23 in suit.

2. The complaint should be dismissed as to all the claims at bar.

/s/ Walter M. Bastian,
Judge.

May 11, 1951.

* * * *

79 Filed May 11 1951 Harry M. Hull, Clerk

Judgment

This case came on to be heard at the last term, and thereupon, upon consideration thereof, it is this 11th day of May, 1951

ADJUDGED that the complaint be and it is hereby dismissed with costs against the plaintiff.

/s/ Walter M. Bastian,
Judge.

* * * *

80 Filed Jun 29 1951 Harry M. Hull, Clerk

Notice of Appeal

Notice is hereby given this 29th day of June, 1951, that Thomas F. Peterson, Plaintiff hereby appeals to the United States Court of Appeals for the District of Columbia from the judgment of this Court entered on the 11th day of May, 1951 in favor of John A. Marzall, Commissioner of Patents, Defendant against said Thomas F. Peterson, Plaintiff.

/s/ Joseph N. Nielsen
Attorney for
Thomas F. Peterson, Plaintiff

* * * *

3 *Proceedings*

THE CLERK: Peterson vs. Kingsland, Civil Action 4362-49.

THE COURT: Will you gentlemen identify yourselves for the record?

MR. NIELSEN: Joseph N. Nielsen for the plaintiff.
MR. MILLER: H. S. Miller for the Patent Office.

* * * *

8 *Jayson C. Balsbaugh*

called as a witness, being duly sworn, was examined and testified as follows:

MR. NIELSEN: Before I proceed with the testimony, I would like to hand in a couple of exhibits to the Court, to which the witness intends to refer in the course of his testimony.

MR. MILLER: No objection.

MR. NIELSEN: I ask that they be marked as Plaintiff's Exhibits 2 and 3.

THE COURT: What is the first exhibit, the file wrapper?

MR. NIELSEN: The file wrapper is Exhibit 1 for the plaintiff.

(The file wrapper in Civil Action 4362-49 was marked Plaintiff's Exhibit No. 1 and received in evidence.)

THE COURT: And these are Plaintiff's Exhibits No. 2 and No. 3?

MR. NIELSEN: That is correct.

(Ayrton Patent 546,802 drawing was marked Plaintiff's Exhibit No. 2 and received in evidence.)

9 (Peterson Application Serial No. 510,256 drawing was marked Plaintiff's Exhibit No. 3 and received in evidence.)

Direct Examination

BY MR. NIELSEN:

Q Professor Balsbaugh, will you give your name, residence and occupation? A My name is Jayson C. Balsbaugh. I live in Wellesley Hills, Massachusetts. I am currently associate professor in electrical engineering at Massachusetts Institute of Technology and, privately, a consulting engineer in Cambridge, Massachusetts.

Q Will you indicate your education? A I graduated from Pennsylvania State College in 1921. Since that time, for one year I was with the General Electric Company and since that time, I have been on the staff of the Massachusetts Institute of Technology in the electrical engineering department at Cambridge, Massachusetts.

I have done a lot of work there in the regular academic line and also have had charge of the electric instrument and measurement laboratory and, for about 20 years, I have had a private consulting engineering firm of my own in which I have worked on cables, electrode static problems, automobiles, hospital operating rooms and problems of that type.

Q You have had rather extensive experience in static problems? A I think so.

THE COURT: I will consider him qualified unless there is desire for cross examination.

MR. MILLER: I will consider him qualified also, Your Honor.

THE COURT: Very well.

BY MR. NIELSEN:

Q I hand you a copy of the Ayrton patent, which is one of the references relied upon by the Patent Office.

MR. NIELSEN: That, I think, is Exhibit A of the Patent Office?

MR. MILLER: Yes.

BY MR. NIELSEN:

Q In this patent, it is stated:

"The improvements consist in forming, coating, or preparing the glass front, shade, or other transparent substance through which the position of the working parts, pointer, or other indicating or recording mechanism or device is seen, so as to produce a screen which is electrically conducting and transparent, thereby shielding them from being affected by external electric forces, while permitting any desired part to be seen."

11 Then it continues later to say:

"Many measuring instruments have their indications or records temporarily altered when the glass which covers the pointer or working parts is cleaned, owing to the glass being electrified by the cleaning process, and electrical instruments on high potential circuits are influenced when the hand or other conductor whose potential differs considerably from that of the working parts is brought near. To prevent these alterations we use a conducting-screen; but instead of employing sheet metal, foil, wire netting or gauze, which has hitherto been customary, we form the screen in such a way as to be transparent or translucent, in order that no portion of the working parts, pointer, or other indicating mechanism or device is obscured by the presence of our screen."

What do you understand by "shielding" as used in this patent? A What I understand by "shielding" as illustrated in this patent—do you want me to refer to this?

Q If you care to, yes. A I understand "shielding" is referred to in this patent just read as illustrated by figures 1, 2 and 3 in this Exhibit 2. To explain it
12 there, if we assume in Figure 1, for example, "G" indicates the glass and "S" this screen, the conducting screen as described, it might be carbon black or any conducting material.

If we attempt to, let's say, clean this glass by somebody coming with a cloth of some type, for example, to clean it, that process develops a negative charge in the surface of the screen. That is indicated by those negative lines there (indicating). Practically, what that means is in the contact of the rubbing material with the glass, some electrons are left on the surface of the glass which sets up an electric field, as we say.

The result of these negative electrons on the surface of the glass is to produce in the Screen "S" in Figure 1 as we indicate it there, positive and negative charges. That mechanism is well known in physics. The reason for that is, briefly, that the negative electrons in front of the glass exert a force on electrons in conducting medium "S" and will push the electrons to the back of that conducting screen and set up these charges here (indicating).

What we are attempting to do in this patent is anything back in position "B", for example an instrument, we don't want it to be influenced by an electric field set up as indicated in Figure 1. The only way that that can be done, fundamentally, is to remove the negative
charge on "S" as indicated in Figure 2. The
13 negative charge, as indicated in Figure 1 at the
rear of "S" will flow off to ground through some
resistance "R", as indicated in Figure 2, leaving as a net result the charges indicated in Figure 3.

Consequently, we come to this conclusion: That the only way that we can prevent or eliminate an electric field back of screen "S", is that a charge has got to flow to ground some way or other. In other words, if, let's say, in Figure 1, this glass and screen were located in free space, it could have no shielding effect. In other words, the shielding and screening, as defined in the patent, is absolutely fundamentally dependent upon draining a charge to ground as illustrated by this sequence in Figures 1, 2 and 3.

Q You are acquainted with electroscopes for which this invention is intended? A Yes, sir.

Q And with screening of electroscopes? A Yes, sir.

Q Is it common to ground them? A You mean you may or may not ground them, depending upon the use you are putting them to. In many cases, they are effectively grounded simply due to the normal leakage resistance across the surface.

Q There is always grounding in effect? A There is always grounding in effect. In other words, grounding must be present.

14 Q Without the grounding, the device would not work? A If it is without grounding, the device would not work.

Q There are Figures 4, 5 and 6 on this exhibit. What do they refer to? A Figures 4, 5 and 6 in this exhibit refer to what are usually referred to as classical examples of charges as producing an electrostatic field and are usually referred to in all works of physics.

For example, in Figure 4 we have, let's say, a metal object that has acquired a negative charge by rubbing some material, a piece of silk or wool or something. Then in Figure 5 if we put another sphere concentric with the first one and we assume that this is located, as we usually say, "in free space" which means that there is no leakage to ground in any way, then again I have indicated, as is usually done in all courses in physics, the charges that are represented. The external sphere that I have shown in there causes no change in any field external to that system at all. I mean fundamentally the field external is the same whether the concentric sphere was placed there or not. That is, in other words, we have introduced no change at all for any point outside. There is fundamentally no difference between the field external at some point between Figure 4 and Figure 5.

In Figure 6, I have shown the external sphere
15 with some resistance, meaning a conducting path which can be a relatively high resistance to ground. Again, the mechanism that happens is that the negative charge or the free electrons that are existing in that external sphere will flow to ground through resistance

"R". What has been done now between 5 and 6, the electric field is completely defined between the two spheres but there is absolutely no external field now outside of the outer sphere and all the external field is completely eliminated. This again refers back to this patent under consideration in that the only way that we can eliminate an electric field back of glass "G" is to have some path to ground from screen "S". That is, in other words, the functioning of this Ayrton patent is dependent upon draining a charge to ground because, if we don't drain that charge to ground then the purpose of the thing would not take place, that is, prevent any electric field from influencing the mechanism which is presumably back of that glass "G".

Q Suppose that in Figure 2 of this exhibit, the resistance "R" was of the order of a million ohms. With what rapidity would the screen discharge? A In Figure 2, if you take representative values, technically what we describe as a charge and capacitance in farads, as we work with them technically, the resistance "R",
for example, can be literally millions of ohms and
16 it is easy to calculate for any reasonable values
of constants in Figure 2 the charge can leak off through resistance "R" in a matter of a thousandth of a second, or less.

This indicates that the resistance "R" does not need to be a direct metallic connection to ground but can represent a leakage resistance across any surface and still the charge will be dissipated within what would be called very short periods of time.

Q I will ask you to refer to the other chart, Exhibit No. 3, which is intended to be illustrative of the Peterson application. In general, will you discuss these figures? A That is, you wish me to discuss Figures 10, 11, 12 and 13?

Q Yes.

THE COURT: They are illustrative of the theory of the Peterson application?

MR. NIELSEN: That is right,—Figures 10 and 11 show the prior art. That is, without the semi-conducting layer and it is Figures 12 and 13 that relate to the Peterson application.

THE COURT: Figures 12 and 13 relate to the Peterson application?

MR. NIELSEN: Yes, but Figures 10 and 11
17 do not. They show what is old in the art.

THE WITNESS: Starting with Figure 10, that is supposed to represent a cross-sectional view, for example, of a rug with the nap indicated by those lines. The sphere that is indicated as above at the lefthand corner due to moving around this rug will develop a charge, as most everyone is familiar with in walking over a rug on a dry day that a charge is accumulated.

Now then, in going to Figure 11, we are assuming that the sphere, as represented by an individual, has moved to another position on the rug. There is one fundamental relation that exists in work of this type that we say a quantity Q of electricity is equal to a capacitance in farads times a voltage—

THE COURT: You are getting rather technical now. What do you mean by that?

THE WITNESS: That is a fundamental relationship in physics where that is the relationship between these quantities and all of these quantities exist here and I was going to tie each one of those quantities with these two figures, 10 and 11.

THE COURT: You make that as simple as you can.

THE WITNESS: I will try to, Your Honor. I am sorry.

By quantity of electricity, what we mean is the amount of this charge, as indicated by these plus or minus
18 signs. From a non-technical point of view, it would represent, let's say, the number of electrons

which exist at that point. In other words, it is a quantity of electricity and, non-technically, it is like having a pint of water, a quart of water or a gallon of water. I mean it is a specific quantity of a charge and, in an electrical sense, we speak of electrons as being a unit of charge so this quantity that I defined as Q is a quantity of a definite thing just like a quantity of, as I said, water.

Now, the other constant in this equation, the capacity in farads, is the unit that is given and, actually, that unit came from Faraday who was one of the very early physicists and very well known. That is a constant which depends upon area; the capacitance between any two objects is defined as proportional to the area and inversely proportional to the distance between them.

For example, if we take Figure 11, as the sphere that is indicated in Figure 11 moves away from some position on a rug, the capacitance is decreased because of the separation, that is, the relative areas stay the same but the separation has been increased.

The voltage in that equation that I stated, quantity Q
is equal to C times E as a fundamental relation, the
voltage is the voltage in volts such as we normally think
of,—that is a measure like pounds per square inch
19 of water—so we say voltage in volts, again being
named after an Italian named Volta. So this fundamental relation Q is equal to C times E has got to remain constant. That equation has got to apply.

Now, the quantity of electricity will stay the same. Therefore, if, in going from Figure 10 to Figure 11, the capacitance is decreased because of increase of the separation as you walk over this rug, therefore the voltage of this sphere or an individual walking on the rug, that voltage has got to increase and that is the mechanism by which voltages are developed, for example, as you walk over a rug. In other words, charges are developed and as those charges are, lets say, pulled apart or separated, a voltage takes place or accumulates on the individual and so between 10 and 11, this sphere will accumulate a voltage because of this fundamental relationship that has got to exist. In going to Figures 12—

BY MR. NIELSEN:

Q Before you proceed with Figures 12 and 13, how high can that voltage be, as a rule? A That voltage that we are talking about in Figures 10 and 11 can very easily be fifty to one-hundred thousand volts.

THE COURT: That is very unlikely, though, is it not?

THE WITNESS: It doesn't have much energy back of it but theoretically, the voltage is back of it. To illustrate that, as we walk across a rug to a radiator, we can pull a spark half an inch long. We can show in a laboratory that it takes 70,000 volts to break down one inch of air; so whenever we break down half an inch of air, actually there are 35,000 volts there. There isn't very much energy there. I mean that would not hurt you in the same sense that, let's say, we know if a very light object might hit you at a very high velocity but without hurting you because there isn't much energy associated with the thing even though it is going at a high velocity, so we can have a substantial amount of voltage but not much energy. So the voltage you get when you walk across the rug can be within the range of twenty-five, fifty thousand volts.

THE COURT: I say, as a practical matter, that isn't a real danger?

THE WITNESS: Not to an individual except there are a lot of places, for example, in hospital operating rooms where they use explosive anesthesias such as cyclopropane that can cause an explosion just like a spark in an automobile engine.

THE COURT: Has it ever done that?

THE WITNESS: As a matter of fact, a tremendous amount of work is being done on that and statistics

show, in hospital operating rooms, one out of fifty
21 thousand operations results in a fatality when
they use cyclopropane. I know a lot of men working on that problem and I could get the reference. I don't recall it.

A lot of hospital operating rooms, for example, have conducting floors to eliminate this charge that is developed. It is a very serious thing there.

Or let's say in powder loading plants where somebody scuffing along can accumulate a sufficient spark to cause an explosion or places where you are testing, say, gasoline engines where sparks might cause an explosion. In other words, these sparks can do exactly what a spark does in an automobile spark plug if the surroundings are such as to introduce a hazard.

THE COURT: I take it in most of those plants and hospitals that they use materials which are non-conductors, do they not?

THE WITNESS: They try to. That is quite a long story. I am working on that currently now. They are using semi-conductors and very complicated means, as a matter of fact, of eliminating that as a hazard but it is really a very serious hazard.

THE COURT: Have you ever had any experience—this is probably outside of what we are discussing now—where there had been any explosions in plants due to this sort of thing?

THE WITNESS: Yes. I mean I have worked in this
field, both static pick-up and automobiles, dust
22 explosions in grain plants and building floors for
powder loading plants and gasoline testing plants. This becomes again quite serious. Just to give you another example, you have seen trucks going along dragging a chain. We, of course, know the purpose of that is again to discharge the static as the truck goes along because the gasoline—

THE COURT: Acting sort of as a ground?

THE WITNESS: Acting sort of as a ground. Otherwise, you would get a spark when somebody would touch the metal frame of the tank to ground which might cause an explosion.

THE COURT: Proceed, sir.

BY MR. NIELSEN:

Q Will you proceed to the discussion of Figures 12 and 13? A In Figures 12 and 13, the principle of the Peterson patent is explained.

In Figure 12, again this sphere would represent an individual at a point on a rug and we indicate positive and negative charges at the point of the inner face or the contact. In Figure 12, the semi-conducting layer is indicated again beneath the rug and a charge will accumulate, as is indicated there.

Now then, in going to Figure 13, the sphere or the
person is again removed to some other place on
23 the rug, as is indicated there. However, in this
case, as we will note from the original negative
charge at the surface of the rug on the left, we have a counterpart, the positive charge in this semi-conducting layer beneath the rug.

As the sphere or object is moved to the right with the sphere having a positive charge and the opposite negative charge in the semi-conducting layer, the capacitance now between the negative charge on the surface of the rug at the left on the top of the rug and the sphere or the person is defined as the capacitance down to the semi-conducting layer and back up through the rug.

In this case, the capacitance actually is not changed between these two charges so that, consequently, no potential is developed by the sphere or the person in moving from the left to the right. In this case, as I mentioned before, we have the fundamental relationship of Q is equal to C times E. Since the charge is constant and the capacitance is constant, the voltage must also remain constant. Accordingly, in this case and as can be proven by test, the person or the sphere moving around on the surface of the rug does not accumulate any voltage.

Q I show you this other reference cited by the Patent Office, the British patent, 541,169, in which conducting elements extend from beneath the rug up to the surface of the rug. Will you explain the operation of
24 that? A I would consider this to be that the person is continually in contact with a grounded object. It would be the same as saying, on a normal rug, that a person was continually, let's say, tied to a radiator by a metal-like string. In other words, in this case you are in contact with a conducting medium continuously.

Q In other words, there is an elimination of charge, if any charge has been created, by the conducting elements in the rug being in direct contact with the person and thereby drawing the charge from the person? A In that case, the charge is continually dissipated through these conducting strips.

Q Do you see any relation between that and the Peterson structure? A I don't see any relationship at all between that and the Peterson structure. One of them is, as we say technically, a conductive coupling, that is, where you are in contact continuously with the conducting medium. Peterson's, we would say that is capacitive coupling and I would consider the two to be fundamentally different.

Q I would like to turn to Exhibit 2 again, that is relating to the Ayrton, et al, patent and ask if there is any resemblance between its structure and the Peterson structure? A I don't think there is any resem-
25 blance between that and the Peterson patent in the sense that the Ayrton screen, to be operative, is fundamentally dependent upon draining a charge to ground. In other words, if we do not drain the charge to ground, it cannot perform its function.

In the Peterson patent, the proper operation of the thing is not dependent upon draining any charge to ground. In other words, we could operate, if we had a rug, let's say, up in free space or between here and the moon, it would work just as well as it would here so there are fundamental differences between the Ayrton patent and the Peterson application.

MR. NIELSEN: The direct examination is closed.

Cross Examination

BY MR. MILLER:

Q If one scuffs a rug with his foot, an electric charge is generated, is it not? A That is right, generally.

Q If one rubs a piece of glass with a rag, an electric charge is generated, is it not? A If the materials are right, yes.

Q And those electric charges, in those two cases, are not essentially different, are they? A Not essentially.

Q In the application here involved, the inventor attempts, does he not, to dissipate the charge gener-
26 ated by scuffing your foot on the carpet? A No.
If I get your question correctly, in the Peterson application we are not trying to dissipate any charge.

Q You were testifying about the patent to Ayrton, et al, were you not? A Yes, sir.

Q Have you read the patent? A Yes, sir.

Q He describes, does he not, what I have already asked you that when you rub a piece of glass, like the face of an instrument, with something to clean it you electrify the surface of the glass? A That is right. I illustrated that in my Figure 1.

Q And he proposes, does he not, to avoid the effects of that electrification or electric charge and he does it, does he not, by making use of a screen? A That is right.

Q And he shows several different places where he can put the screen, does he not? For example, in Figures 1, 2 and 3 the screen, I suppose, is on the inside of the glass face of the instrument, is it not? Assuming the lefthand is where you were—

(The pending question was read by the reporter.)

27 THE COURT: I wish you would start over again. It looks as if you have three or four questions in that one question.

BY MR. MILLER:

Q Where does he put the screen that he proposes to use to avoid the effects of this charge? A The screen is located to the right of Figures 1, 2 and 3.

Q Is that inside of the glass cover or outside the glass cover? A Well, it would normally be inside as we are thinking of the outside of the instrument.

Q As a matter of fact, doesn't the patent say on Page 1, the left-hand column, line 50:

"In some cases the screen is formed on the inside of the glass or other transparent cover"? A That would be the most logical place for it.

Q Then he goes on to say, does he not:

"—whereas in other instances the screen is outside the glass or is separate therefrom"? A Yes, you could put it out there as long as it was not damaged by injury. The only reason to put it inside is the protection.

Q And is it not true in Figure 4 that the screen is in between two pieces of glass G? A That is all right, too. You can put it a number of places.

28 Q When you were reading this patent of Ayrton, did you find any statement that that screen "S" should be grounded? A No, he makes no statement that it should be grounded in the sense that we think of grounding. Usually when we make the statement of grounding, we mean that we take a copper wire, let's say, and metallically connect it to ground.

What I think I have proven, and I am sure is fundamentally sound, is that it does not have to be grounded.

We can have a million ohms or, say, a billion ohms, a very high resistance and for all practical purposes it will work just as well as if you had a direct metallic wire connected to ground but, fundamentally, that charge has to drain off of that screen to make the thing operative.

Q The charge on the front of the glass described by Ayrton could have been drained off, could it not, simply by grounding? A The front of the glass?

Q Yes. A Normally, there you are dealing with an insulating surface. These electrons that I have indicated in Figure 1, for example; that is a strong insulating surface there so they will tend to drain off but certainly not very fast, as can be demonstrated by experiment.

Q It is true, is it not, that one way to dissipate a
charge is to ground like you referred to the gaso-
29 line truck with a chain dangling down on the
ground? A That is right.

Q But there are other ways, are there not, of avoiding the effect of a charge besides grounding? A I am not quite clear as to your question there.

Q Isn't there any other way it can be done besides grounding? A Yes. As I have explained in this Ayrton patent, the ground—

Q No, without a ground. Isn't there some other way that you can avoid the effect of a charge without using a ground? A Now, you have to be a little more specific there. I mean that is a very—

Q Is grounding the only way you can avoid the effect of a charge? A In the Ayrton screen—

Q I am not talking about Ayrton. I am talking about an electric charge anywhere. By grounding it, you say you avoid the effect of it. Is that the only way you can avoid the effect of it?

MR. NIELSEN: I would like to have him explain what he means by "effect".

THE COURT: I think it is pretty obvious what he means.

THE WITNESS: I mean I am not quite clear.
30 That is such a broad general statement. I mean
I can imagine I can draw a specific illustration—

BY MR. MILLER:

Q Does Ayrton propose to avoid the effect of a charge by some expedient not including a description of grounding anything? A He undoubtedly found that, in all practical instruments, the charge drained off fast enough without a direct grounding and, accordingly, said it was not grounded.

Q You were testifying about the British patent. Did you read this patent? A I did.

Q It discloses in Figure 1, does it not, a rug with textile fabric like a carpet? A That is right.

Q And it has on the back of it, has it not, something like rubber made semi-conducting with carbon on it? A It is a conducting medium.

Q And he describes, does he not, that that is supposed to avoid the deleterious effects you get by the static electricity effects when you scuff on the carpet? A Only when he brings those conducting tufts to the surface, I believe.

Q I havent said anything about any conducting tufts
yet. I merely asked you whether he proposes, by
31 what he shows here, to avoid the effects of the
static charges generated when you scuff on the top
of that carpet? A Well, again—

Q Does he or does he not? Does he want to get away from these effects of static? A I mean you can't answer, Your Honor, yes or no. I mean the patent clearly states it is dependent upon these conducting tufts to this bottom strip. To say "the bottom strip" indicates it is only part of the thing.

Q Will you look at the patent on Page 1, the left-hand column, line 46? Doesn't he say this:

"Among the objects of our invention are to provide a pile rug having static dissipating characteristics for the purpose of eliminating the annoyance of static shock".

Doesn't he say that? A That is part—

Q Does he say it or doesn't he? A I didn't—

Q Does he say it or doesn't he say it? Just answer the question. A Will you give me a chance?

Q Yes, I will. It is either yes or no. A I couldn't find the place until he had finished the thing so I hadn't really checked it.

32 THE COURT: He says now he has seen it.

BY MR. MILLER:

Q Doesn't he say:

"Among the objects of our invention are to provide a pile rug having static dissipating characteristics for the purpose of eliminating the annoyance of static shock".

He says that, doesn't he? A That is part of it. That is in there.

Q You like to hedge with me. You don't say yes or no. Either he does say it or he doesn't say it. A From a technical point of view, you can misrepresent that statement unless you go on. I can't remember every statement in here.

Q In his device as shown in the drawing, Figure 1, he doesn't use any connection to ground to do that, does he? A None is shown there.

Q As a matter of fact, he describes, does he not, in the patent on Page 2 in the left-hand column beginning at Line 59:

"The layer of conducting rubber composition 5 functions as a condenser". A I haven't found the exact place yet. I am very sorry. You say line 59?

Q The lefthand column, beginning at line 59.

33 He says, does he not:

"The layer of conducting rubber composition 5 functions as a condenser". A That is right.

Q You see that. Now, if that conducting composition were directly connected to the ground, there wouldn't be a condenser, isn't that right? A That is right.

Q He does say, does he not, in describing another modification—and look on the same page in the right-hand column beginning at Line 76—will you read what he says there, please, in the middle of the line? A (reading) "It is also to be understood that the rug may be electrically grounded by electrically contacting with any conducting body."

Q If he did that, he would have the same static dissipating means, would he not, as the chain hanging down from the gasoline truck to carry off to ground the static charges? A That is correct.

MR. MILLER: That is all.

Redirect Examination

BY MR. NIELSEN:

Q You have been questioned as to the Ayrton and British patents as to avoiding the effect by means of the screen. What does the screen do in the Ayrton
34 patent? A The screen in the Ayrton patent
permits a charge to flow to ground so as to eliminate the electric field back of this glass but it is fundamentally dependent upon a charge flowing to ground to make the thing operate.

Q In other words, there is no charge remaining to affect anything, is that correct? A As I have shown on Figure 3, there are still charges but, to any point back of the glass since there are only two charges and they are opposite in sign, their effect is zero and we do that by draining off this charge.

Q There is no effect on anything beyond the screen? A That is right. We have completely eliminated any electric field back of the screen.

Q The same question was asked in connection with the British patent as to the effect of the charge. Is there any charge in that British patent in view of the tufts extending to the surface; a charge on a person, I mean, and referring now to the British patent. A You mean Figure 1 of this British patent?

Q I will repeat. Your attention was called to the bottom of Column 1 on Page 2:

"The layer of conducting rubber composition 5 functions as a condenser",

and further over:

> "It is also to be understood that the rug may
> 35 be electrically grounded by electrically contacting
> with any conducting body."

As I recall the question, it was worded to ask you as to the effect of the charge in that connection, but I am not sure whether I got the question right or not. In other words, is there any charge there to create any effect in view of the tufts which extend to the surface for direct contact with the body? A In that case, you are contacting a conducting medium continuously.

Q And any charge has been eliminated through that means? A For all practical purposes, this British patent on the rug, you might just as well walk upon a conducting rubber rug to start with. I mean it would have exactly the same results as if we walk on a conducting rubber strip.

The only purpose there is to hide these tufts to get the advantage of that and still make the rug look like a conventional rug but I mean for all practical purposes, we may be walking on a metal floor, for example, or a conducting rubber floor.

Q Are there any statements in these patents, in the Ayrton patent or the British patent, concerned with the creation of sparks or their effects? A Sir, I didn't quite get that question.

36 Q To repeat the question, the Peterson patent is directed to the elimination of voltage and spark-

ing from that cause? A The Peterson patent is directed to the elimination of voltage, that is right,—not to the elimination of charges.

Q Is there anything of that character to be found in the Ayrton or British patents? A I can find nothing that has reference to that.

MR. MILLER: That is all.

MR. MILLER: No further questions.

I would like to introduce formally in evidence, although I have already handed it up, Items A to G, inclusive. That will be all the evidence on behalf of the Patent Office.

THE COURT: That will be Defendant's Exhibit 1.

(Items A through G were marked Defendant's Exhibit No. 1 and received in evidence.)

THE COURT: When do you want to file your briefs, gentlemen?

MR. NIELSEN: I still have another witness, Your Honor.

THE COURT: I am afraid we will have to take him tomorrow.

MR. NIELSEN: That will be all right. My primary purpose was to get Dr. Balsbaugh away because he has other appointments tomorrow.

37 THE COURT: How long will your witness take?

MR. NIELSEN: I suppose about the same length of time.

THE COURT: Who is the other witness?

MR. NIELSEN: Mr. Peterson, the inventor. There are some other phases I want to bring out. I might say this, if there is no objection on the part of Mr. Miller—

THE COURT: I don't want to shut you off. You are entitled to put on your case the way you want to. I am just trying to find the time to do it.

MR. MILLER: Excuse me for having introduced my evidence. I thought he was all through with his testimony.

THE COURT: That is what I understood, too, but he is not. I will let you put on your case but I should think, with the testimony already given, that Mr. Peterson could probably limit his testimony to less time than this gentleman.

* * * *

40 *Thomas F. Peterson*

called as a witness in his own behalf, being first duly sworn, was examined and testified as follows:

Direct Examination

BY MR. NIELSEN:

Q Mr. Peterson, will you state your name, residence and occupation? A My name is Thomas F. Peterson. I live in Shaker Heights, Ohio. My occupation is an electrical engineer.

Q And your education? A I graduated from Stanford University as a Master of Science in 1925 where I had done considerable work on high voltage spark discharge from conductors, overhead transmission lines and from points. I have some pictures taken from my thesis indicating the early work done on spark discharges which was done in 1923, the fore-runner of this work.

THE COURT: I will assume he is qualified.

MR. MILLER: I will concede that the witness is qualified.

THE COURT: Yes.

41 BY MR. NIELSEN:

Q In other words, you have had considerable experience in connection with static discharges? A Since 1923, I have been engaged in high voltage research engineering as Director of Research for the Brooklyn

Edison Company and for the American Steel & Wire Company.

I have a dozen or so patents on high voltage cables and structures using semi-conducting layers. Many of these patents were used very extensively during the war in making cables, making radar possible. They are found in high voltage transmission lines for eliminating the effects of spark discharges and corona around conductors, television interference, radio interference. Spark discharges of all sorts have been the subject of my investigation for well over 25 years now.

Quite recently, some work was done by the Bonneville Power Administration, a government agency, with the Oregon State University laboratories on this question of corona and spark discharges. I have some photographs taken as recently as last week on other inventions of mine involving semi-conducting shielding for the elimination of these spark discharges.

MR. NIELSON: Would Your Honor care to have those?

THE COURT: No, I think they bear on his qualifications and I am sure he is well qualified.

42 BY MR. NIELSEN:

Q Will you indicate the circumstances that led to the present invention, the one here in issue? A As I have indicated, some of the work that I was engaged in was concerned with spark discharges. In particular, I did a great amount of work on spark plugs for automobiles, and ignition; working with the Bureau of Standards on the design of non-sparking cables.

I did a lot of work on dust explosions and especially the effect of electrical static discharges in creating those explosions. For example, where dust is prevalent or where we have explosive mixtures of gas, if a non-conducting, that is, an insulating belt on a motor moves along in dry air, the static builds up on the belt and tries to jump off and, in fact, does jump off and can create some of the explosions that we read about in munition plants, loading plants.

I have done a lot of work in mines where these corona discharges outside of cable can cause explosions where the gases are prevalent in proper amounts.

I have done considerable work in connection with hospital operating rooms where, as pointed out yesterday by the witness, there is a very decided hazard coming about from small sparks or discharges resulting from the doctors and nurses walking on waxed floors, moving around with insulating tubing, rubber gloves and things of that sort.

43 Of course, almost everybody is familiar with the sparks that develop when you walk over a good dry rug on a winter day. It is more prevalent out west where I happen to live at the moment but we all know that and we all like to do something about it. I know many things that can be done. You can go over the rug with a sprinkling can and wet the rug down and then you won't get any sparks or you can put some metal wires on top or walk on a metal floor and there won't be any spark hazard but we do like to have rugs, linoleum and nylon covers on automobile seats and we do have these spark discharges developing in a rather annoying way and a hazardous way. I have worked with and on all of these problems.

Q Will you indicate what your concept was in the development of this invention and how you accomplished it? A As I have indicated, the problem is there. There were many solutions to the problem. Very frequently, metal mats are applied in ammunition loading plants, for example. I have designed cables for draining the static from these mats to insure against spark discharge but all of these methods come down to one or another of two simple approaches to the solution.

One is to stop or prevent the charges from accumulating. That is one way to get around this; just don't

allow the charge to develop and when you walk on
44 a wet rug or on a metal floor, you just don't get a
charge so there is no problem.

The other is if there is a charge, get it drained away through wires, through conducting rubber mats, any way you can; get it drained to earth so that there is no charge. One stops it; the other, if you do happen to have it, gets rid of it.

As I have indicated, those are commonly known methods of eliminating this problem or this difficulty but what I wanted was something simple that did not involve the use of special floor covering; for example; specially built rugs with wires, or something poking through them. I wanted something simple and what I chose to do was to recognize that the little charge might develop but I was going to control that charge so it would never result in a spark that would be harmful or difficult to deal with.

What I did was to introduce a semi-conducting layer underneath the conventional rug. It didn't have to be grounded. It didn't have to function as a drain. It didn't stop a little charge from accumulating on the surface of the rug or on the person but I control that little charge so that no sparking voltage would develop.

The best illustration I can give to point it out is to
go back to lightning and thunder. We have two
45 clouds. These two clouds have opposite charges
on them and nothing very unusual happens if
those two clouds sit there or ride around together but if those clouds are separated, one from the other, the charge stays the same on each cloud, positive here and negative there. When they get separated by an updraft of wind, the voltage, the potential is increased until finally something is ready to let go and snap and we have a spark discharge which we all recognize, lightning and thunder.

I got this idea of simply introducing under the conventional carpeting, rug, linoleum, a semi-conducting layer to accomplish this purpose.

Q Did you actually try it out; make tests of it? A I made innumerable tests and I brought with me samples of some of the products that I developed. The first is a piece of carpet which is just ordinary carpet on which I sprayed a semi-conducting rubber latex and vulcanized that to develop a rug which had not only these non-sparking properties but it was non-skid. It worked nicely on the floor.

I applied the thing to tile, spraying on a semi-conducting layer on the bottom of floor tile. This is similar to what is on the floor of this court room. It has nothing on it but that semi-conducting layer.

In places where existing rugs, carpet or automobile cushions might be developing trouble—seat covers on automobiles are the popular type of sparking—I
46 just lay a layer of semi-conducting cloth underneath the regular nylon cloth and all of these were tested and found to be very effective and very useful. There is no grounding. There is no dissipation of the charge and no problem with sparking.

Q Mr. Peterson— A If I may continue—the testing of these merely consisted in taking two identical rugs, one without the layer and one with the layer and walking over them to determine how much of a spark was obtained and picking that up by radio methods to give sensitive indications of sparking and there are just no sparks that develop from this structure.

Q Did you file an affidavit in the course of the prosecution of your application describing these tests? A I did; and indicating the objectives, the results of the tests and what I considered I had invented which was an effective non-sparking floor covering or covering.

It develops that this is a very cheap and inexpensive way of doing what can be done by many other methods.

There are no additional hazards. I perhaps did not stress the additional hazards in my original patent application but there are hazards that should be recognized in connection with any of these.

I cite two for example. Getting down to stern realities of life if, for example, a baby with wet pants 47 should sit on a rug that has conducting material undearneath and conducting wires or threads coming up through and should accidentally poke a wire into a base plug, it could well be electrocuted because there would be a complete drainage path back to ground for the 110 volts. There is no sparking involved in that.

On the other hand, it might well develop with some of these other methods, having wires under the rugs, for example, or conducting materials that can come to the top of the surface, suppose they are not effectively grounded and that is one of the very serious problems when you don't have a good ground. If the 110 volts of the lighting circuit should happen to get on this wire mesh, then it is alive. It doesn't blow any fuse because there isn't a good enough ground for that. Then someone might touch or would be on that and happen to touch a radiator which would be a good ground and they could be electrocuted.

So there are two very definite hazards with the conventional methods such as shown in the British patent, for example. With this, there is just no problem because the insulating material that we use for the covering is quite effective. It isn't penetrated and the incidental hazards are not there.

MR. NIELSEN: If it please Your Honor, I would like to offer these in evidence as Peterson exhibits.

48 MR. MILLER: No objection.

THE COURT: Very well.

(Samples of floor coverings were marked Plaintiff's Exhibit No. 4 and received in evidence.)

MR. NIELSEN: I would like to make a brief demonstration to show what semi-conducting is, how it operates. That is the factor involved in this case.

THE COURT: Go ahead.

MR. NIELSEN: It will just take a few seconds.

THE WITNESS: This is a little light plugged into 110 volts and when I plug this in, I light this (indicating). The metallic contact makes that brilliance.

These coatings—this is a sample of the rug that I have manufactured—are semi-conducting and I get a partial light indicating a fairly high resistance but that is the direct metallic contact and this is the semi-conducting resistance that is here (indicating).

If you go far enough, that light would go out but it is very effective for handling this little charge that floats around.

I believe I can show the same thing on the bottom of this tile. The material is semi-conducting. I am letting the current run from this point—that is the direct metallic contact—to the semi-conducting ma-
49 terial but there is nothing going through the tile.
I can't get anything coming from one side to the other. I am touching both sides. It is insulating in depth, as we say in the patent, and it is semi-conducting laterally.

BY MR. NIELSEN:

Q So, in other words, by means of this semi-conducting layer on the bottom of the rug which has no connection with the top surface of the rug, you do attain your objectives of no voltage and no possibility of shorts? A That is correct.

As given somewhat theoretically yesterday by the professor, scuffing around on the rug or on the linoleum does develop a little charge on the body but there is an opposite charge in the rug and some of it underneath on this semi-conducting layer and as the person moves around, this other charge floats right around with the person and, therefore, no sparking potential develops. There is no need for grounding. There is no need for draining the charge that is developed and, as Professor Balsbaugh pointed out yesterday, this would work halfway up to the moon or any other place in space.

Q There was a matter that was brought up yesterday that I would like to have you clear up and that is about the question of the effect of the charge in this Ayrton
patent. A The Ayrton patent, if I may get away
50 from the highly technical—each one of us has a
fair replica of what the Ayrton patent consists of.
It is a wristwatch, for example, which is an instrument that has pointers under a glass case. My sleeve rubbing on the glass case could put a little charge on the glass.

That is exactly what Ayrton was concerned about because in his instrument, instead of having a watch with relatively stiff pointers, he had a very delicate pointer of an electroscope and those little leaves, those little pointers were affected by that charge sitting on the glass and he proposed to remove the effect.

That was one kind of an effect, the effect of attraction underneath the glass. What he did about it, he put soot, as he said, on top of the glass, in betweeen two layers of glass or on the inside of the glass. I would like to interject at this time that that would hardly be workable or applicable for floor covering because his glass with the soot on the outside, which certainly could not develop any static, if you would rub that you would rub the soot off, take it off on your hand. If you touched the inside soot, you would also rub it off but his device worked because he didn't touch the glass. The hand does not rub on the inside of the glass.

What Ayrton did was to eliminate the effect of that
attraction. Getting back to this word "effect", I
51 think there was considerable uncertainty and con-
fusion on the part of both attorneys and Your

Honor and even the witness but Your Honor was the only one who indicated his uncertainty as to this effect.

I would just like to say: If the question were—what is the effect of sunshine, we could hardly answer it. Do we mean the effect of sunshine to evaporate water and make rain or to sunburn a bather or to affect the growing plant in the normal events? There are infinite effects of sunshine.

There are a great many effects of electrical charges. One is attraction. Another one is to ionize and form this corona in air. Even when there is no spark, if I were to take you into a high voltage laboratory and have a charge on the body, one effect might be that your hair might stand on end and you would feel a little tingling and that would be an effect. It might do many things so this question of effect in the Ayrton patent, the effect was electrostatic disturbance forces on this pointer.

We are not concerned about that. You could not very well take, if you could walk on the glass of the Ayrton, you could not very well take the Ayrton glass with a layer of soot on the bottom and put it down here as a floor covering because the soot would not be there as soon as you touched it and scuffed it and it would be ineffective.

52 I think that is all I have to say on the Ayrton case.

Q There was another statement that I would like to have you clarify in connection with the British patent and that was at the bottom of Page 2, Column 1, about the condenser. A Yes. The British patent unfortunately, I suppose, is directed to something quite similar to this rug. It has a layer of what I would consider conducting rubber underneath and, in addition, has the threads woven up through to come up to the top and that is one of the requirements, that all this conducting material come up and they are spaced about every two inches so that you just can't get away from it. You are always in contact with it.

As the British patent indicates, the purpose of these tufts and the layer on the bottom—in one place it says that the rug may be electrically grounded by electrically contacting with any conducting body. That is the bottom part of the rug but, as has been pointed out, there is also this question of a condenser action in case there isn't a metal wire running from the bottom of the rug to a water pipe and I don't think the reading was far enough yesterday because it stopped short of the end of the sentence and I will read the whole sentence:

> "The layer of conducting rubber composition 5 functions as a condenser and has a sufficiently great
> 53 capacity to receive and then dissipate accumulation of static by leakage."

What he is indicating, and I like to illustrate with analogies, if we had a fire engine here pumping water, we can pump water into the hose and get a stream of water coming out but what is usually done is have a little airdome as kind of a condenser, an intermediate receiver and pump into that and it condenses or holds it for a while and then sends it on its way and that is what is indicated here; that this is a condenser, the charge is leaking off the body. The person may have come from some other place, dropped off the planet Mars, or right out of the air and that is very definitely a problem, too, which we do not ordinarily recognize.

I don't want to labor the point but the question of whether this sparking is really serious—when an airplane goes through the air, it accumulates a charge and high potential and the thing that happens when it gets near the ground is to develop a tremendous spark, sometimes 20 or 30 inches after the planes have gone from Honolulu to San Francisco, for example, as they approach the water.

Now, the person may land on the rug with a charge and the charge leaks through the tufts on the top and, as is indicated here, the layer on the bottom acts as a condenser to accept part of the charge almost instan-
taneously and then, as Professor Balsbaugh indi-
54 cated, the leakage off develops through the wood,
through the concrete and, in a matter of a thousandth or a millionth of a second, it is gone.

Q May I interrupt you? That charge that is collected in this rubber layer, that is the charge taken from the person through these tufts? A That is correct, conducted through the tufts.

Q And so the condenser is the result of the charge on the surface of the rug created by the friction and then the charge transferred from the person to the bottom of the rug and that is, as I understand, of a fleeting character, extremely temporary, because the charge taken from the person to the bottom of the rug is carried off, as Professor Balsbaugh explained yesterday? A That is what I intended to convey. The speed with which all these discharges take place is just hard to comprehend because when we deal with these mathematically, we use expressions like 10 to the minus sixth power second. That means one millionth of a second; or a billionth, 10 to the minus ninth.

We are talking of things like that and we get that kind of leakage even without a good wire. If we had a wire discharging this, it would just be zero seconds.

I don't know that I have emphasized the difference yet, as fully as I might, between the British rug and
what I have developed. In the British rug, we
55 have to manufacture a special rug. I don't know
how it would be applied to a piece of floor tile. We would have to have something come up through that tile, some little buttons every two inches as against this (indicating). Again, the tufts coming up must contact the person. They can get dirty. They might get worn

out and so you would not have that drainage that he was relying on and, of course, the cost of preparing it.

I just can't conceive of anything similar. Of course, the simplicity of this thing of mine is the thing that makes it somewhat baffling and rather difficult to get across to the Patent Examiners and the problem has been here: Why hasn't somebody done something about it? And I come along with a little piece of black cloth or a little piece of black paper and put it under the rug and the problem is solved.

That seems to be too simple. They have to draw on Ayrton who, I guess, lived in 1890 or something like that, and combine it with some British patent and they point out that there is no invention. I will grant you it is a difficult one to comprehend but I hope I have made it at least clear as to what I was driving at and what I think I achieved.

MR. NIELSEN: Direct examination closed.

Cross Examination

BY MR. MILLER:

Q Mr. Peterson, you were talking about sparks in hospitals when the nurses walk on the carpet.
56 What is it that causes the sparks? A The spark is caused in this way: The frictional contact between the shoe of the nurse, and let us say, the linoleum, two differing materials. It might be glass and silk or leather and linoleum in contact with one another and moved on one another, or separated. It is really a separation which develops a slight charge; positive on one subject, negative on the other.

When those two charges are separated from one another by an appreciable distance, say a foot or two feet, then the potential, the voltage, the urge for this charge to get back to the original charge is increased. It is almost like having a rubber band and the first frictional engagement puts the rubber band under a little strain. There is a charge on each end of the rubber band in doing that. If we stretch that rubber band apart, they want to come together with a vengeance and that is the spark.

Q Then if there was no electric charge, there would be no spark? A No.

Q The British patent which you have been talking about, indicates, does it not, on Page 1, the left-hand column beginning at Line 46, that it is:

> "Among the objects of our invention are to provide a pile rug having static dissipating characteristics
> 57 for the purpose of eliminating the annoyance of static shock"? A That is correct.

Q In your case, Mr. Peterson, your specification describes, does it not, that in the case of Figure 1 of your application, for example, you accomplish this by using a sheet 13 underneath the rug. Your specification states, does it not, that that can be a sheet of rubber, or its equivalent, made semi-conducting by the incorporation of conductive carbon particles? A That is correct.

Q And it is true, is it not, Mr. Peterson, that in the British patent, he also uses in his Figure 1, a coating underneath his carpet, does he not? A Yes, he takes a coating, as described here.

Q What is it made of? A It is a rubber compound containing carbon to make it conducting.

Q You testified, I believe, that the British patent also has some conductors extending from that coating on the back up to the surface of the rug. Will you point out to the Court where they are on the drawing of the British patent? A Those conductors are indicated as No. 4 in Figure 2 extending from the layer on the bottom which is 5 and running up through the rug. In Figure 3, they are indicated as No. 6.

58 Q Then, Mr. Peterson, if you left out those conductors 4 in Figure 2 of the British patent,

you would have substantially what is shown in your application in the figures which relate to a rug, would you not? A It might look the same in the drawing, yes.

Q I mean structurally. All you have in your application here is, in Figure 1 of your drawing, you have a carpet and you have underneath it layer 13, do you not? A That is right.

Q And that layer is of this semi-conducting rubber with carbon particles. On the British patent, you were describing what was there in this Figure 1 likewise. Here is the carpet and here is the coating which you say, likewise, was made of rubber with carbon particles.

Now, if the British patent stopped there and had nothing more, he would have the same thing that you have there. A I can't agree with that. There are other aspects of this. The British patent shows the elements 4 as an integral part of the rug and you will notice they go down and form a part of the layer 5 whereas I have no threads for going through the rug and the conducting layer on the bottom of my rug does not form an integral part of the rug, necessarily. It can be a separate sheet of paper.

59 Q In other words, if one went over the rug of Figure 1 of the British patent, as shown in Figure 2, and very carefully clipped out all of those little condensers 4, then what is left would be the same as yours, wouldn't it? A Well, I don't know that it would because, among the objectives of the British patent—

Q I am not talking about the objectives at all. I am just talking about what the thing is, the carpet and what is underneath. A I imagine they would be very similar.

MR. MILLER: That is all.

MR. NIELSEN: I have a little redirect.

Redirect Examination

BY MR. NIELSEN:

Q This British patent also speaks of preventing charges, doesn't it? A It does.

Q And in that part that you read on Page 2, the second column at the top, it there indicates:

"By spacing the conducting elements or cords 4 throughout the area of the rug, the static is not only discharged from a body contacting the rug, but no substantial accumulation of static is possible because of the frequent displacement of the conducting elements which pass through the rug." A That is correct, and in my earlier testimony I tried to emphasize that when these conducting elements are up on the surface in any form, no substantial accumulation of static is possible. We do not generate static under those circumstances.

I also indicated that if a body came on to the British rug from afar with a charge, then the first part of that statement in Column 2 on the second page, up around Line 63:

"By spacing the conducting elements or cords 4 throughout the area of the rug, the static is not only discharged from a body contacting the rug, but no substantial accumulation of static is possible because of the frequent displacement of the conducting elements which pass through the rug."

Q And under those conditions, there would be no possibility, of course, of any voltage or potential increase? A That is correct. The mechanism, as I have indicated several times, is first a charge is accumulated and then if there is separation, the voltage, the strain, the potential gets great enough to cause the spark.

In this British case, he either prevents the charge from showing up any place or he drains it off and there is no sparking potential possible, no sparking possible;

whereas in my case, a charge does develop. It is cre-
ated, a little charge does develop on the body. I
61 might say that one of the limitations of my design
would be that you might not use it in a powder
plant where extreme 100 per cent spark and charge elimination is needed. In those cases, we use copper floors to insure against any kind of charges appearing any place or any sparks developing from just contact with the metal, like a piece of flint going across.

There is a slight discharge develops on my rug but it never gets to this sparking potential to be annoying when you come and touch the floor. You don't have to wait and worry about whether you are going to turn the key or touch the door knob because you know what is going to hit you if you don't get it. Conceivably, there might be a tiny charge that could even cause an explosion in a very critical or special case. I wouldn't recommend this, for example, for an operating room where these extreme precautions are being taken. As a matter of fact, in present-day operating rooms, everything is made conducting insofar as possible—the whole layer of linoleum, the tubing going to various pieces of equipment are made conducting on the outside; not on the inside so as to avoid any possibility at all. Just handing an instrument from one place to another may develop enough to cause a spark in that case.

We have not solved, or I have not solved all of those problems. What I have solved is a man riding in an
automobile, sliding over his new nylon seat covers
62 and maybe getting a spark when he comes near
the metal door and possibly having an automobile
accident as a result of it but it isn't absolutely a cure—

Q But by the absence of these tufts 4, you do insure that there is no possibility of short circuiting? A Exactly. There are other advantages that develop; the hazard from short circuits, electric light circuits, electrocution of people who might be in contact with this, just as happens sometimes, as indicated yesterday if somebody is in the bathtub and has a contact with ground through the water in the pipes, touches a defective switch and is killed. Or has wet feet. Very frequently people are killed around bathing beaches. A thunder storm comes up. Somebody runs down in the basement to change a switch, has wet feet on concrete, not on any water pipe or metal, just damp wet feet on concrete, touches a live part of the switch and is killed.

It isn't necessary to have the full metallic grounding that we so frequently hear of and I eliminate that possibility which is very serious when you think of the millions of yards of carpeting and linoleum and so forth that is sold. When these things are properly installed, as in the hospital room, and well grounded then the hazards are eliminated but when we are leaving them to the indiscriminate user—if someone's wife bought 63 a rug and had to have instructions as to how to keep the tufts coming through and keep them clean and make sure they are grounded or something of that sort, we would not have a very practical working device.

MR. NIELSEN: Redirect closed.

MR. MILLER: No further questions.

• • • •

Plaintiff's Exhibit No. 1

Filed Mar 22 1951 Harry M. Hull, Clerk

• • • •

SPECIFICATION

To All Whom It May Concern:

BE IT KNOWN That I, *THOMAS F. PETERSON*, a citizen of *the United States of America*, residing at *Shaker Heights*, in the County of *Cuyahoga*, and State of

Fig. 1.

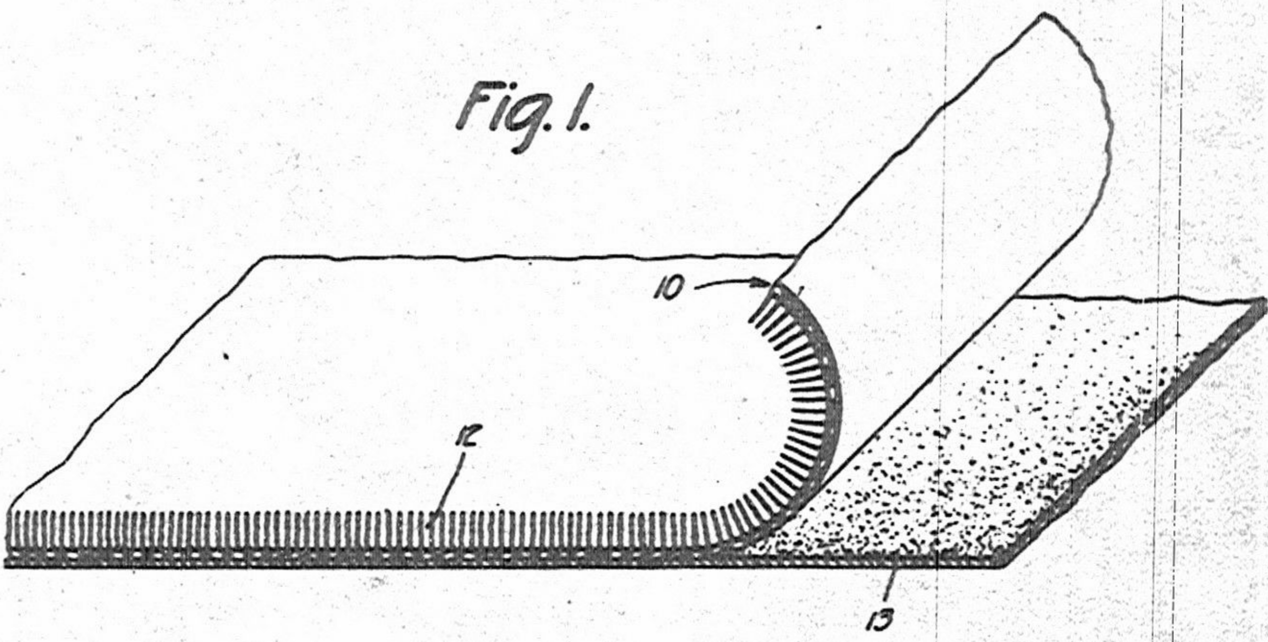


Fig. 4.

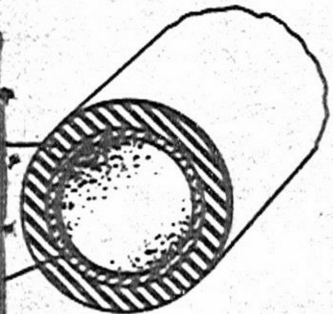


Fig. 2

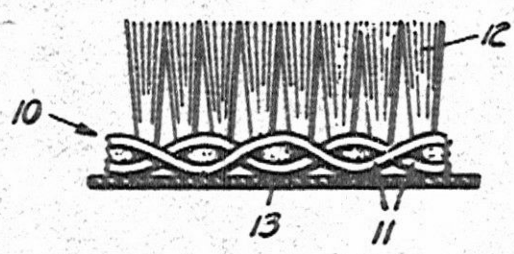


Fig. 6.

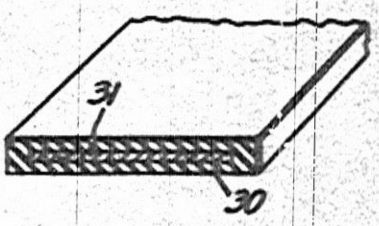


Fig. 5.

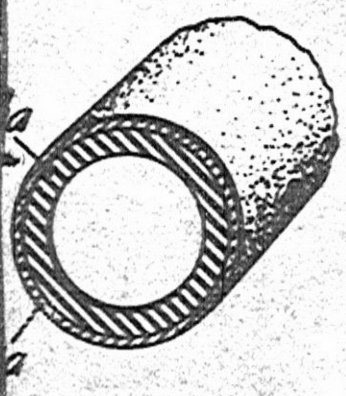


Fig. 3.

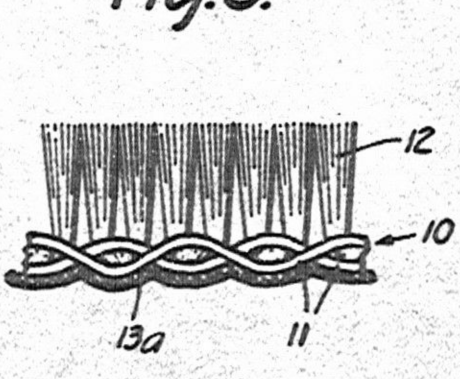
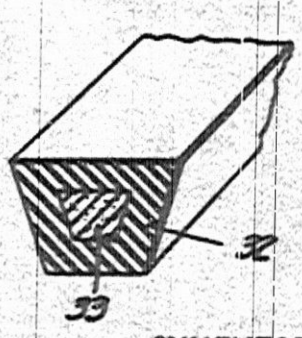


Fig. 7.



INVENTOR.
Thomas F. Peterson

Ohio, have invented certain new and useful improvements in *NON-STATIC STRUCTURES* of which the following is a specification:

This invention relates to articles of flexible sheet structures characterized by an electrically non-conductive nature and intended for uses and under conditions that may develop static electric charges, such as machine belts, sand conveyors, floor and seat coverings, etc.

Under conditions of low humidity, especially in winter, the articles become dry and accordingly high in electrical insulating value. When a person walks over a dry rug, for instance, he picks up a charge, and as this charge on the person is separated from the equal opposite charge in or at the under surface of the rug (localized because of the non-conductivity of the rug), work is done which appears as an increase in potential or voltage difference between that of the person and that of the rug and is stored as energy in the dielectric separating the two charges; the potential so acquired is indicative of the "urge" for the charges to get together and neutralize each other, and the net result is that the person in moving away from the charge in the rug may build up a potential difference of several thousand volts that is sufficient to develop a spark when within striking distance of a conductor or object at low or ground potential. Similarly, a belt in slipping or moving over a pulley carries away a charge of increasing potential to discharge to some grounded conductive object near which it passes. These discharges are not only annoying but also dangerous, since the sparks may cause explosions, fires and the like.

The hazards attending sparking have long been recognized. The proposals for their elimination heretofore have depended upon making the structures electrically-conducting by incorporating or weaving into them wires or other conductive elements or bodies extending through the structures to maintain the entire surface area at or near ground potential and so dissipate any charge before it acquires a sparking potential. Such proposals, however, require that the fabrics or materials be specially woven or originally constructed to include the conductive elements. Metal wires woven into fabrics or otherwise incorporated in the structures, such as carpet, linoleum, rubber belts, tubing, etc., however, not only add to the cost, but they are, as a rule, objectionably unlike the structures in their physical properties; moreover wires may corrode and become useless, and they have the potential danger of causing electrical short circuits.

The present invention provides for the convenient modification of existing belts, floor coverings, etc. into articles of the "non-static" type without resorting to "built-in" wires or other changes in the basic structures or their physical characteristics. It avoids the difficulties and dangers inherent in the incorporation of wires and/or conductive elements on working surfaces by the simple expedient of providing a semi-conducting flexible layer of rubber, fabric or the like, and in contact and substantially coextensive with a surface of the structure, such as the underside of a floor rug.

By the provision of such a layer surprising and unexpected results follow; for instance, no electrical contact need be provided from the layer to the upper or opposite surface of the rug, belt or other structure to interfere with its insulating properties, nor is it necessary to provide any grounding for the semi-conducting layer. To illustrate, when a person scuffs a rug in contact with an underneath semi-conducting layer, he acquires a slight charge and a small potential exists between that charge and the opposite charge located in or under the rug; but when he moves along the surface of the rug, the charges are not drawn apart to an objectionable extent, for the semi-conductive layer provides a leakage or flow of the charge along its surface and the charges therefore remain apart at substantially the same distance; accordingly no substantial amount of work is done, and no increased potential difference is created of such magnitude as to cause sparking or electrical disturbances. Similarly the sparking, commonly occurring when a belt slips or moves on its pulley, disappears with the addition of a semi-conducting layer to the outer belt surface or within the belt structure, since the layer affords a leakage for any charge carried by the belt and so prevents the building up of a potential. The rug, belt or other article, however, is not thereby made sufficiently conductive to carry dangerous short circuit currents.

A convenient embodiment of the invention takes the form of a sheet of rubber or its equivalent made semi-conducting by the incorporation of conductive carbon particles. As an example, conventional rubber stock usually contains from 10 to 20 parts of reinforcing carbon black per 100 parts of rubber; with these amounts of carbon black the conductivity of the rubber is not materially altered, and its resistivity normally ranges between 10^{13} and 10^{14} ohms per centimeter cubed. But, by introducing before vulcanization approximately 35 per cent by weight of conductive carbon black, the resistivity of the rubber stock is reduced to 10^{7} ohms per centimeter cubed, and increase in percentage of carbon black to about 50% further reduces the resistivity to approximately 10^{3} ohms per centimeter cubed; these resistivities are clearly in a zone intermediate between resistivity and conductivity, and accordingly are termed "semi-conducting". Rubber or equivalent compounds that can be so modified in their resistivity include natural rubber; the various forms of synthetic rubbers; and thermosetting and thermoplastic rubber-like materials, such as oil-modified phenolic resins, plasticized polymers or copolymers of vinyl esters (as the chloride, acetate, etc.), polymerized styrene and acrylates, etc. Conductive carbon includes channel black, acetylene black, amorphous graphite and the like. When the carbon black in fine particle form is properly dispersed in the material, there is not only developed an electrical semi-conductivity but there are generally improvements in the physical properties, such as resistance to abrasion, tearing, etc.

Embodiments of the invention are illustrated in the accompanying drawing in which

Fig. 1 is a perspective view of an assembly of a portion of a rug and an underlying semi-conducting sheet structure;

Fig. 2 is an enlarged cross-section of a small portion of the assembly of Fig. 1;

Fig. 3 is a similar enlarged cross-section showing a modification of the assembly;

Fig. 4 is a perspective view of a piece of tubing of insulating material with an interior coating or layer of semi-conducting nature;

Fig. 5 is a perspective view of a piece of tubing with an exterior coating or layer of semi-conducting nature; and

Figs. 6 and 7 are perspective views of pieces of belting having cores of semi-conducting material.

For use with a rug 10, comprising a base 11 of woven fabric supporting a pile 12 as illustrated in Figs. 1 to 3, a semi-conducting sheet structure 13 as described in the foregoing is made commensurate in size with or extending beyond the edge of the rug, laid on the floor and then covered by the rug. So positioned, the sheet 13 acts not only to make the rug static-proof by transferring charges generated in the rug, but it also serves as a "non-slip" medium under the rug. A particularly useful application is under rugs in hotel lobbies in the vicinity of elevator entrances where static usually discharges from a person to the elevator push button; this can be discharged through the rug or at the edge of the rug to the semi-conducting layer.

Instead of preparing a homogeneous sheet containing conductive carbon particles uniformly dispersed throughout the sheet, the semi-conducting carbon-containing compounds can be applied as an impregnant or coating on a base such as paper, textile fabrics, unwoven fibrous elements or on fibers in felted or loose form. The conventional and known methods of knife-spreading or calendering the semi-conductive materials in a viscous state, or the methods of spraying into or on the sufrace of the base by means of a solution can be used.

Moreover, the semi-conducting layer need not be physically separated from the other floor covering or other structure. It can be an integral part in the form of a layer 13a spread or sprayed on or into the article itself, such as the underside of a rug, as shown in Fig. 3. Or the thread elements, forming the backing and supporting the pile of a rug, can be impregnated or coated with the semi-conducting substance; such a construction does not interfere with the pile or wearing surface of the rug or its insulating property.

Tubing can be similarly provided with semi-conducting coatings or layers either on the inside or the outside surfaces. When the friction occurs on the outside of the tube 20, such as a tire casing, the layer 21 is placed on the interior as shown in Fig. 4; when the frictional forces occur within the tubing 20a, Fig. 5, as in conveying sand and other materials, the layer 21a is placed on the exterior of the tubing. The layers function as in the case of the rug by preventing a building-up of potential difference through separation of the electrical charges.

In the construction of belting, conveyors, or the like, the semi-conducting layer can be sandwiched between the layers of the conventionally used non-conducting materials or as a surface of the structure. This is illustrated in the flat type of belting by Fig. 6, showing a belt 30 with a core 31 of semi-conducting material; and in the V-type belting by Fig. 7 showing a belt 32 with a core 33. The cores serve to prevent the increase of potential difference as before. Obviously there need be no interference or modification of such properties in the structure as strength, flexibility, wear, and resistance to abrasion, light, chemicals, weathering, etc. that are normally desired in the structure.

While the various forms of rubber and resinous materials can be modified into semi-conducting layers as described, some modifications of the procedure may be entailed for certain materials. This applies, for instance, to the thermoplastic vinyl polymers or copolymers. It has been observed that these materials do not yield satisfactory semi-conductivity merely by the physical incorporation of carbon particles, because of the tendency of these polymers to return to their original shape upon subsequent heating and cooling. The corrective lies in subjecting the polymers to a sufficiently high temperature and pressure such as to release the strains in them that cause the tendency to distortion and thus inteference with semi-conductivity. This can be accomplished, for example, in a calendering operation on a sheathing or rough backing with "Vinylite" (copolymer of vinyl chloride with a small percentage of vinyl acetate) or "Koroseal" (polymerized vinyl chloride) by heating to temperatures of the order of 300° F. and applying high pressures; it is then found that the semi-conductivity and physical properties are retained in subsequent heatings of the materials.

WHAT IS CLAIMED IS:

1. Non-static structure having a surfacing of electrically conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing a semi-conducting material affording leakage for a charge on the structure upon separation of the corresponding opposite charge.

2. Non-static structure having a surfacing of flexible electrically conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing a flexible semi-conducting material affording leakage for a charge on the structure upon separation of the corresponding opposite charge.

3. Non-static structure having a surfacing of electrically conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing a semi-conducting nonmetallic material affording leakage for a charge on the structure upon separation of the corresponding opposite charge.

4. Non-static structure having a surfacing on one side of electrically non-conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing on a non-exposed side of the structure a semi-conducting material affording leakage for a charge on the structure upon separation of the corresponding opposite charge.

5. Non-static floor covering having a surfacing on one side of electrically non-conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing on the underside of the floor covering a semi-conducting material affording leakage for a charge on the floor covering upon separation of the corresponding opposite charge.

6. Non-static belting having a surfacing on one side of electrically non-conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing and interiorly of the belting a semi-conducting material affording leakage for a charge on the belting upon separation of the corresponding opposite charge.

7. Non-static tubing having a surfacing on one side of electrically non-conducting material exposed to frictional static-engendering contact and comprising in substantial coextension with said surfacing on a non-exposed side of the tubing a semi-conducting material affording leakage for a charge on the tubing upon separation of the corresponding opposite charge.

* * * *

Affidavit Under Rule 75

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Thomas F. Peterson, residing at Shaker Heights, Ohio, being duly sworn deposes and says:

He is the applicant for Letters Patent identified above.

He completed the invention in this country prior to August 2, 1940 and in support thereof avers:

(1)—He took a sheet of rubber, made semi-conducting by the incorporation of conductive carbon black as described in his application, that was approximately two feet square, and he placed it under an ordinary high nap rug in his office in two locations; in one location the edge of the sheet was in contact with a grounded radiator, and in the other location it was out of contact. Before the rubber sheet was put in place, he scuffed his feet over the surface of the rug on a winter's day and in this manner built up a potential in his body that caused sparking to the grounded radiator. The scuffing was repeated but with the semi-conducting sheet under the rug and an edge of the sheet in contact with the radiator; but no sparks could be drawn by the radiator. Again the scuffing was repeated with the rubber sheet under the rug and the edge out of contact with the radiator; there was no sparking on contacting the radiator. The sheet of semi-conducting rubber is still on test under the rug where it was successfully tried.

(2)—A strip of rug about 3 feet long was coated on the under side with rubber latex made semi-conductive with conducting carbon black and the coating was vulcanized. An ordinary floor rug was scuffed as before, and on approaching another body or object, such as the radiator there was the usual sparking. The coated strip was then laid on top of the rug, and the strip was scuffed as before; the semi-conducting rubber backing did not allow the development of static sparks on contacting another body or the radiator. A small sample of this strip is attached hereto as Exhibit A.

He does not know and does not believe that the invention has been in public use or on sale in this country, or patented or described in a printed publication in this or any foreign country for more than one year prior to his application; and he has never abandoned the invention.

/s/ Thomas F. Peterson

Sworn to and subscribed before me this 23rd day of January, 1945.

/s/ Corinne G. Johnson
Corinne G. Johnson
Notary Public, New York
County No. 50
My Commission expires March 30, 1946

* * * *

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to the Office action of August 8, 1946, please amend by canceling the claims and substituting:

21. Non-static floor covering comprising in combination a flexible textile layer electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving in a lateral direction thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the lateral movement of the body, and a second layer of semi-conductivity in substantially coextensive contact with the non-exposed surface of the textile layer providing for induced charge leakage in the line of lateral movement of the body to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

22. Non-static structure comprising in combination a layer of flexible material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving relative thereto and thereby creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the relative movement, and a second layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the flexible layer providing for induced charge leakage later-

ally in the direction of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

23. Non-static structure comprising in combination a layer of material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body to thereby create an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by a relative movement, and a second non-metallic layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the layer providing for induced charge leakage laterally in the line of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

Remarks

Following the interview requested for the purpose of obtaining the Examiner's interpretation of the Ayrton et al patent cited in the last action, the claims have been rewritten and reduced in number with the view to avoiding any possible construction that makes them readable on that patent. It seems obvious that the object to which the present invention is directed is not remotely present or suggested, and any similarity of structure is accidental.

Filed Mar 22 1951 Harry M. Hull, Clerk

Defendant's Exhibit No. 1

Thomas F. Peterson v. Marzall, Civil Action No. 4362-49

A—Ayrton et al	546,802
B—British patent	541,169
C—Print of Drawing	
D—Examiner's Statement	
E—Reply to Brief	
F—Decision by Board	
G—Decision on Reconsideration	

• • • •

Jun 30 1948

Examiner's Statement

The applicant appeals from the Final Rejection of claims 21 to 23. No claims are allowed.

The appealed claims read as follows:

Claim 21. Non-static floor covering comprising in combination a flexible textile layer electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving in a lateral direction thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the lateral movement of the body, and a second layer of semi-conductivity in substantially coextensive contact with the non-exposed surface of the textile layer providing for induced charge leakage in the line of lateral movement of the body to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

Claim 22. Non-static structure comprising in combination a layer of flexible material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving relative thereto and thereby creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the relative movement, and a second layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the flexible layer providing for induced charge leakage laterally in the direction of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

Claim 23. Non-static structure comprising in combination a layer of material electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body to thereby create an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by a relative movement, and a second non-metallic layer of semi-conductivity in substantial coextensive contact with the non-exposed surface of the layer providing for induced charge leakage laterally in the line of the movement to prevent substantial increase in the potential between the charges, the semi-conductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

The references relied on:

Ayrton et al	546,802	Sep. 24, 1895
British patent	541,169	Nov. 14, 1941

The Applicant's Disclosure

The applicant's disclosure relates to a conductive coating that is placed on a surface of a body of insulation whereby the generation of static electricity by frictional contact with the body is prevented. The coating may be applied to an insulating pipe such as a hose as shown in figures 4 and 5, or to a rug as shown in figures 1 to 3, or to belts as shown in figures 6 and 7. The species of figures 1 to 3 are elected for prosecution. These figures show a rug having the usual construction of a woven base indicated at 10 and supporting a pile 12. It is known in the art that rugs have been known, under some conditions, to accumulate static charges of hazardous intensity when they are scuffed by walking on them. The applicant proposes that a coating of some suitable semi-conductive material such as a rubber composition comprising graphite be disposed on the lower surface of the rug. The claims state that the coating is coextensive with the textile layer and on the non-exposed surface of the rug.

The Prior Art

The British reference is directed to preventing static electricity on a rug. The rug is similar to applicant's and has a conductive coating on the bottom surface. The coating itself is the same as suggested by applicant. The rug of this reference comprises conductive elements 4, 6 and 8 which are electrically connected to the conductive coating. Any mass or body moving across the top side of this rug is electrically connected to the coating 5. The coating 5 is not necessarily grounded, and ordinarily functions as a condenser, having a sufficiently great capacity to receive the static and then dissipate it by leakage.

The Aryton patent shows a way to prevent static electricity from accumulating on the glass front of a sensitive meter or the like. The patent states, at line 32, page 1, and following, that measuring instruments have their indications or records temporarily altered when the glass which covers the pointer or working parts is cleaned because the glass is electrified by the cleaning process. The patent proposes a way to prevent the disturbance. The patent teaches that a conductive coating may be associated with the glass either on the inside surface or the exposed surface. In figure 4 the conductive coating 5 is disposed between two layers of glass. The conductive coating may be placed within the glass or on the inner side, and in either case the coating is not exposed. The screen or conductive coating is effective as a protection against static charges which are caused by some object being moved over the surface of the glass. See line 24 and following on page 2.

The Rejection

Claims 21 to 23 are rejected as unpatentable over the British patent 541,169 in view of Aryton. This British patent shows a rug similar to applicant's and the rug has a conductive coating on its non-exposed surface. It is clearly taught in this patent that the conductive coating need not be grounded and that the coating will act capacitatively to prevent static electricity. The British patent has conductive elements 4, 6 and 8 which contact any object moving over the surface of the rug and connects it directly to the conductive coating on the lower surface of the rug. The applicant's rug has only a conductive coating; there are no elements similar to 4, 6 and 8 of the British patent. The applicant has not alleged any facts that would suggest that his rug constitutes an improvement over a rug similar to the British patent or that his rug functions as a protection against static electricity better than the rug of this patent.

The British patent provides an element for electrically interconnecting directly any moving object on the surface of the rug and the conductive coating; the coating is capacitatively connected with the ground. The applicant has used a capacitative connection between the moving object and coating. Both kinds of connection are known and have been widely used. The British patent employs a capacitative connection between the ground and the coating.

The Aryton patent employs a capacitative connection between the moving object on his glass and the coating on the opposite surface or the coating laminated within the glass (Figure 4). The moving object in Aryton's case is something, a rag or the like, that is rubbed over the surface of the face for the purpose of cleaning it. It is immaterial from the standpoint of reducing static whether the window material is flexible or not. The essence of the disclosure in the Aryton patent is that a conductive coating is put on one surface of a body of insulating material for the purpose of preventing static which results from an object being moved over the opposite surface. There is nothing which electrically directly connects the moving body to the coating by contact or direct connection. The connection between moving object and conductive coating is capacitative. The coating on the rug in the British patent may function with the moving object in a similar manner, and the elimination of the direct connectors such as 4, 6 or 8 does not result in a patentably new combination of rug and coating, for a capacitative connection is old in the art and shown by the Aryton patent. The elimination of elements 4, 6 and 8 so as to utilize a capacitative connection between moving object and coating in the British patent would result in a structure identical with the applicant's rug.

It is respectfully submitted that the rejection is proper and the Examiner should be affirmed.

Respectfully submitted,

/s/ Leo Quackenbush
Kal Actg. Examiner

* * * *

U. S. Patent Office Feb 7 1949 Mailed

Examiner's Reply

Reply to applicant's Brief filed January 29, 1949.

The applicant's discussion of the rejection beginning at page 6 of the Brief indicates some misunderstanding of the statement of the Examiner. The British patent at page 2, line 59 to line 82, states that the layer 5 functions as a condenser. To say that it functions as a condenser is to say it acts capacitatively and its disclosed purpose is to prevent static. Obviously the layer 5 of this British patent is one plate of a condenser, the other plate being the ground. The patent goes on to say that the rug may be mounted on padding so long as the layer 5 and the threads 4 are in contact. If the layer 5 is a condenser as stated, it is obviously capacitatively connected with the ground, for that is what the layer 5 functioning as a condenser means. It is stated further that the rug may be electrically grounded by electrically contacting with any conducting body. This statement is believed to mean a direct connection may be used from the layer 5 to ground. In this case the layer 5 would not act as a condenser nor would it be capacitatively connected with the ground, but the connection would be direct. The disclosure where the layer 5 is directly connected to ground is a different but equivalent one. The applicant's layer 13 is not directly connected to ground. It would function as a condenser in the same way that the layer 5 functions as a condenser. Actually the layers are the same and both are on the bottom of a rug.

The elements 4, 6 and 8 of the British patent are left out in the applicant's case. This is all the difference there is in the applicant's rug and the rug as shown by the patent. The British patent uses a capacitative connection between the layer 5 and the ground and a direct contact connection by means of elements 4, 6 and 8 between the moving body and the layer 5. In an equivalent embodiment both connections may be direct or by contact since the layer 5 may be grounded. The applicant has removed the direct or contact connection between the moving body and the layer 5. He thus effects a change wherein the connection between both moving body and layer, and between layer and ground are capacitative. The applicant has not made any other change of any kind in the rug disclosed by the British patent. The issue resolves into whether this change constitutes allowable subject matter.

An examination of the prior art of static reduction reveals that capacitative connections are known. The Aryton patent shows a means for reducing static on a piece of glass wherein the conductor may be on one side while the static producing thing, which is a moving contacting object, is on the other. The applicant contends that the coating is in fact a part of an enclosing shell and the instrument shielded by Aryton is completely enclosed in a conductive shell. The patent, however, is silent on that and does not say that the instrument is completely enclosed in a conducting shell; it likewise does not state that the coating is grounded. The patent talks about the glass window and static produced by a contacting moving across its face. The patent teaches that the static may be prevented by placing a coating of conductive material on the opposite inner surface, within the glass (Fig. 4) or on the outer exposed surface. In the first two the coating is related capacitatively to the static generating member; in the third case the relation is one of direct contact. Either one may be used.

Further, while the Rostal and Chapman patents have not been directly applied, they were made of record as cumulative art for the purpose of showing that capacitative connections are known and are in use. The elements g and e in Chapman like 10 with 4 in Rostal are related electrically in the way condenser plates are related or through capacitance. The Aryton coating on the inner surface of the glass is similarly related to static generating member.

The applicant has removed the elements 4, 6, 8 from the rug of the British patent changing from a contact connection between the moving body and the coating 5 to a capacitative connection between them. Both kinds of connection are known as the art shows, Aryton in particular. Moreover, the British patent itself uses both kinds of connection. The Examiner's statement is believed correct and in harmony with the art. The applicant has not made an invention by changing from contact to capacitative connection, for the two are equally well known.

It is respectfully submitted that the Rejection is proper and the Examiner should be affirmed.

Respectfully submitted,

/s/ S. Bernstein
Examiner, Div. 48

Kal

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BEFORE THE BOARD OF APPEALS

Ex parte Thomas F. Peterson

Application for Patent filed November 13, 1943, Serial No. 510,256. Non-Static Structures.

Mr. Joseph N. Nielsen for appellant.

This is an appeal from the action of the Primary Examiner refusing claims 21, 22 and 23. There are no allowed claims.

Claim 21 is reproduced below:

21. Non-static floor covering comprising in combination a flexible textile layer electrically non-conductive laterally and in depth, said layer being exposed on one surface to frictional static-engendering contact by a body moving in a lateral direction thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon their separation by the lateral movement of the body, and a second layer of semi-conductivity in substantially coextensive contact with the non-exposed surface of the textile layer providing for induced charge leakage in the line of lateral movement of the body to prevent substantial increase in the potential between the charges, the semiconductivity of the second layer being of a character to insure against accidental conductance of harmful current amperage.

The references relied upon are:

Ayrton et al	546,802	Sept. 24, 1895
British patent	541,169	Nov. 14, 1941

The subject matter of the appealed claims and the disclosures in the reference patents is described in the statement of the Primary Examiner and further amplification thereof is unnecessary.

Claims 21, 22 and 23 are rejected as unpatentable over the British patent in view of Ayrton et al. The British patent shows a rug similar to applicant's which has a semi-conductive coating on its non-exposed surface but the British patent has conductive elements 4, 6 and 8 to directly electrically interconnect any moving object on the surface of the rug with the semi-conductive coating. Ayrton et al show a capacitative connection between a moving object on one side of a sheet of glass and a semi-conductive coating on the other side. It is the position of the Examiner that it would not call for an exercise of invention to substitute the capacitative coupling of Ayrton et al for the electrical connection in the British patent.

It is the contention of the applicant that the semi-conducting coating of Ayrton et al is connected to the metal case and the whole forms what might be termed a cage which acts as a conducting screen, and that "there is no semblance to or recognition of preventing increase of the potential difference."

We cannot agree with applicant's contentions. Even though it was customary in the past to *shield* a meter by placing foil, wire netting, etc. over the front of the instrument and connecting it to the casing there is nothing in Ayrton et al to positively show that his screen functioned in this manner. The term "screen" is rather broad and has no particular significance here for this term is applicable to all functions of this character. It is not limited to any particular method. If Ayrton et al intended to ground their screen it seems to us that they would have disclosed, either in the drawings or the specification, their method for carrying out this feature, otherwise the disclosure is incomplete. Their method is operative without a grounding connection. In Fig. 4, for example, the semiconducting coating S would dissipate any potential charge which would tend to collect on the rear surface of the front glass of the cover and thus prevent the building up of a high potential on the front surface of this glass. Since no connection to ground is disclosed and since their method is operative without such a connection we are of the opinion that Ayrton et al did not intend to rely on such a connection.

Since it is old in the art to prevent the building up of static charges by direct electrical connection to a dissipative coating, as shown by the British patent, or by a capacitative coupling to a dissipating coating, as shown by Ayrton et al, we are of the opinion that it would not require the exercise of invention to select either method to prevent the accumulation of static charges generated on rugs or similar objects. The two methods are functionally equivalent.

The rejection of the claims by the Examiner is sustained.

We have carefully considered the applicant's brief but we are not convinced by the contentions made therein that the Examiner made any error in rejecting the claims.

The decision of the Examiner is affirmed.

In event of appeal attention is directed to *In re* Boyce, 32 C.C.P.A. 718; 144 Fed. (2nd) 896; 1944 C.D. 609; 568 O.G. 568; 63 U.S.P.Q. 80 in regard to specifically including in the appeal notice *all* grounds of rejection in the

Examiner's statement not expressly overruled by the Board.

/s/ F. J. Porter
Examiner-in-Chief

/s/ Mark Taylor
Examiner-in-Chief

/s/ W. E. Waite
Examiner-in-Chief
(Acting)
Board of Appeals

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Request for Reconsideration

The appellant requests a reconsideration of our decision of April 14, 1949, affirming the decision of the Examiner. The appellant's brief, filed on May 20, 1949, is accompanied by an affidavit of one Jayson C. Balsbaugh, an alleged expert in the art.

The request for reconsideration was filed on April 26, 1949, but the "brief" with respect thereto was not filed until May 20, 1949. Reasons are given for the delay in filing the brief but no good and sufficient reasons are given for not having presented the affidavit earlier in the prosecution of the application. The claims now on appeal were rejected on the same combination of only two references as they are now rejected as early as October 2, 1947. The fact that the affidavit was filed within a month after the request for reconsideration was made shows that the affidavit could have been filed much sooner had appellant so desired. New Rule 195 precludes the admittance of affidavits or exhibits "without a showing of good and sufficient reasons why they were not earlier presented." Accordingly, the affidavit is not considered.

The request for reconsideration is granted. We have carefully considered appellant's brief in support but we are not convinced by the arguments made therein that we made any error in our original decision in affirming the rejection of the appealed claims by the Examiner. Accordingly, the request is denied as to making any changes in our original decision.

/s/ F. J. Porter
Examiner-in-Chief

/s/ Mark Taylor
Examiner-in-Chief

/s/ W. E. Waite
Examiner-in-Chief
(Acting)
Board of Appeals

• • • •

(No Model.)

W. E. AYRTON & T. MATHER.

SCREENING ELECTRICAL OR OTHER INSTRUMENTS AND APPARATUS.

No. 546,802. Patented Sept. 24, 1895.

Fig.1.

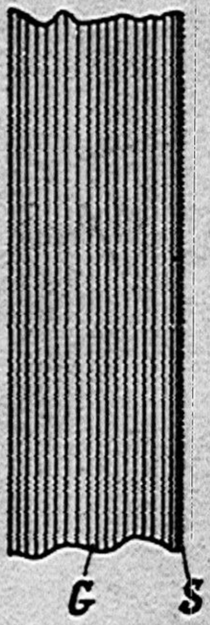


Fig.2.

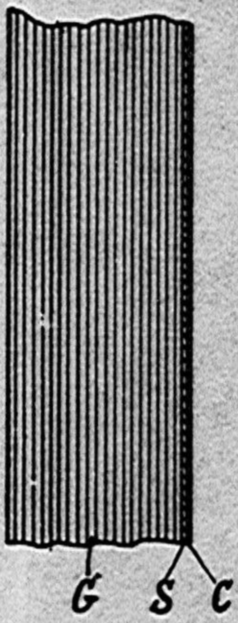


Fig.3.

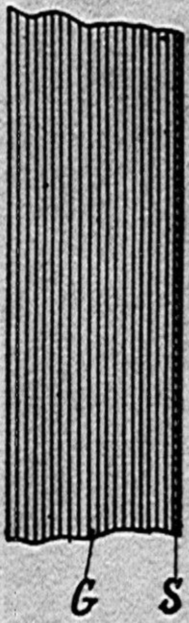
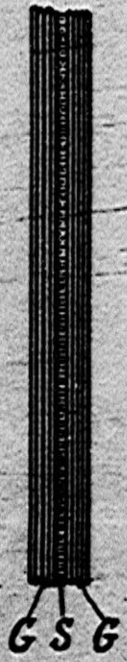


Fig. 4.



Witnesses.

William Gold Rhodes.

John Severs

Inventors

William Edward Ayrton

Thomas Mather

UNITED STATES PATENT OFFICE.

WILLIAM EDWARD AYRTON AND THOMAS MATHER, OF LONDON, ENGLAND.

SCREENING ELECTRICAL OR OTHER INSTRUMENTS AND APPARATUS.

SPECIFICATION forming part of Letters Patent No. 546,802, dated September 24, 1895.

Application filed July 3, 1893. Serial No. 479,523. (No model.) Patented in England May 16, 1893, No. 9,753.

To all whom it may concern:

Be it known that we, WILLIAM EDWARD AYRTON, residing at 41 Kensington Park Gardens, and THOMAS MATHER, residing at 19 Agamemnon Road, West Hampstead, city of London, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Screening Electrical and other Instruments and Apparatus from the Influence of Disturbing Electric (not magnetic) Forces, (for which we have obtained Letters Patent in England, No. 9,753, dated May 16, 1893;) and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its object the screening of electrical and other instruments and apparatus from disturbances caused by electric forces.

The improvements consist in forming, coating, or preparing the glass front, shade, or other transparent substance through which the position of the working parts, pointer, or other indicating or recording mechanism or device is seen, so as to produce a screen which is electrically conducting and transparent, thereby shielding them from being affected by external electric forces, while permitting any desired part to be seen.

Many measuring-instruments have their indications or records temporarily altered when the glass which covers the pointer or working parts is cleaned, owing to the glass being electrified by the cleaning process, and electrical instruments on high potential circuits are influenced when the hand or other conductor whose potential differs considerably from that of the working parts is brought near. To prevent these alterations we use a conducting-screen; but instead of employing sheet metal, foil, wire netting or gauze, which has hitherto been customary, we form the screen in such a way as to be transparent or translucent, in order that no portion of the working parts, pointer, or other indicating mechanism or device is obscured by the presence of our screen.

In some cases the screen is formed on the inside of the glass or other transparent cover, whereas in other instances the screen is outside the glass or is separate therefrom.

In the accompanying drawings we have illustrated the application of our conducting-screens to glass or other transparent covers or casings.

All the figures represent sections of portions of the covers of instruments or apparatus to be screened from electric forces.

Figures 1, 2, and 3 are drawn to a large scale, so that the relative thickness of the cover and of the screen may be fairly correct, while in Fig. 4 the scale is about full size.

In all the figures similar parts are indicated by the same letters, G denoting the glass or other transparent cover, and S the conducting-screen.

One method of forming a screen on the cover is to smoke the glass lightly by supporting it over a flame which is smoking a little. By holding the glass some distance above the flame and keeping it in motion, a thin deposit of carbon is put on, which acts as an efficient screen without seriously impairing the transparency of the glass.

Instead of a film of carbon, attenuated deposits of silver, mercury, zinc, or other metal which can be deposited chemically, electrically, or mechanically, or vaporized by heat, may be used. A section of cover and conducting-screen formed by deposition of carbon or metal is represented in Fig. 1, the deposit being indicated by the dotted lines to the right of the figure; but the method which we have found best is the following: Dissolve one-fourth of an ounce of transparent gelatine in one ounce of glacial acetic acid heated to 100° centigrade, and while the solution is still hot add to it a quantity of dilute sulphuric acid, (eight parts water and one part concentrated acid, by volume,) equal to half its volume, and mix thoroughly. Polish the glass to be coated, and heat it as hot as it can be comfortably held in the hands. Then apply the mixture of gelatine and acids with a soft brush and allow to stand in a dry place for twenty-four hours. After this time the coating will be nearly but not quite hard. As a protection for the conducting film so formed, one or more coats of Griffith's transparent antisulphuric enamel, consisting of gum dissolved in fusel oil, is put on. This form of screen is shown in Fig. 2, where G is the cover to which the screen is applied, S the conducting layer, and C the protective coating. Before applying the enamel or other varnish over the conducting coating above described, an intermediate coating, consisting of gelatine dissolved in acetic acid or in water, may be given, in order to form a harder surface, and the varnish subsequently applied. In cases where there is no probability of the surface being rubbed or touched we may dispense with the protecting coating of varnish. Fig. 3 represents this form of screen, G being the cover and S the conducting layer unprotected by varnish. Coatings of other substances, such as isinglass, starch, gums, or other transparent cements rendered conducting may be employed. In some cases cells containing conducting and transparent liquid or jelly may be used as screens. Fig. 4 shows this method of making transparent conducting screens, G G being the sides of the cell, and S the transparent conducting liquid or jelly.

Our invention is particularly useful for electrostatic measuring-instruments where the working forces are feeble. Electrostatic voltmeters usually have their indications affected by bringing the hand or other conductor near them or by rubbing the glass front. Our invention enables us to completely screen them from such influences without hiding the pointer or working parts behind opaque covers. Electroscopes may be similarly screened by having the glass covers coated as described, instead of by tin-foil, as is usually done, and electrometer jars may have their outsides coated, thereby allowing the working parts to be seen, and at the same time forming efficient screens.

It will be readily understood that our invention is useful not only for electrostatic measuring-instruments, but for electrical measuring-instruments of the electromagnetic or other types whose indications or records are liable to be influenced by external electric forces. It can also be employed with advantage to screen any kind of instrument or apparatus, whether electrical or otherwise, from disturbances due to electric forces, which might otherwise interfere with their correct working.

Having fully described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In combination with a transparent cover for electrical and other instruments and apparatus a transparent electrically conducting screen S as described.

2. In combination with a transparent cover for electrical and other instruments and apparatus a transparent electrically conducting screen formed of adhesive material as described.

3. In combination with a transparent cover for electrical and other instruments and apparatus a transparent electrically conducting screen of adhesive material covered by a protective coating as described.

WILLIAM EDWARD AYRTON.
THOMAS MATHER.

Witnesses:
PERCY GILBERT LEDGER,
ROBERT PERCY BROUSSON.

541,169 COMPLETE SPECIFICATION

1 SHEET

[This Drawing is a reproduction of the Original on a reduced scale.]

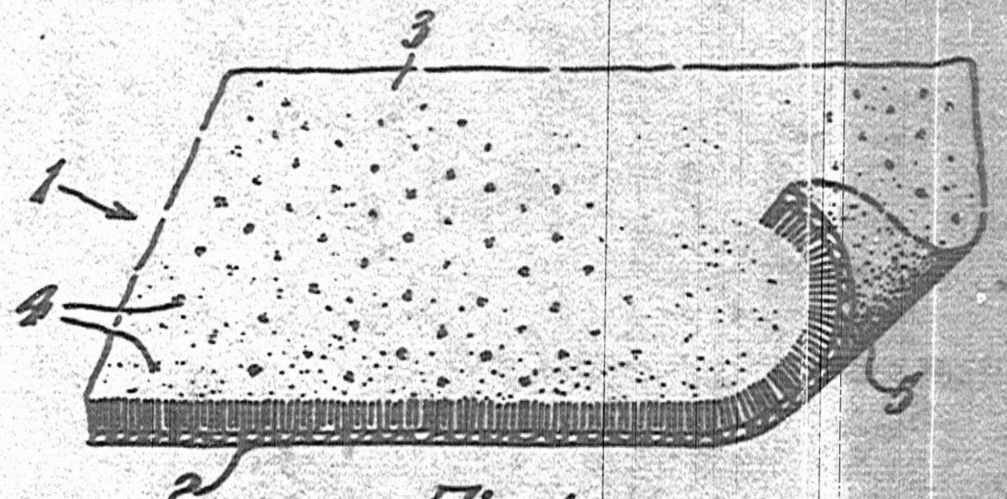


Fig.1

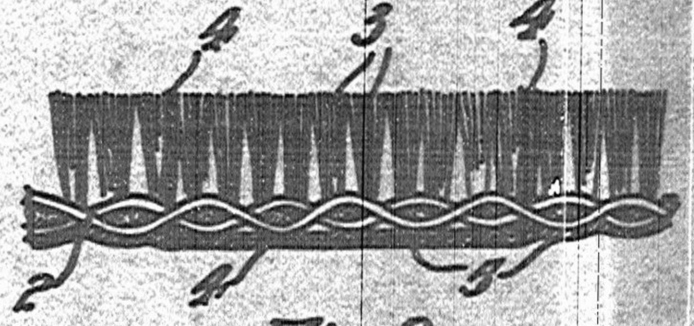


Fig.2.

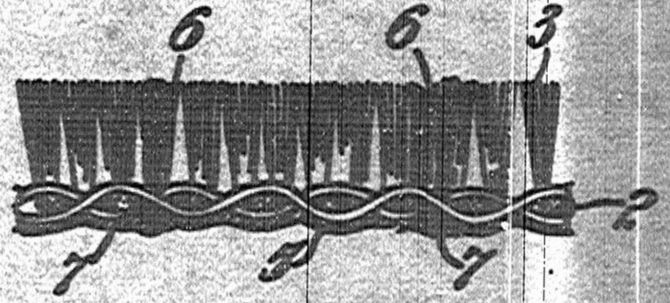


Fig.3.

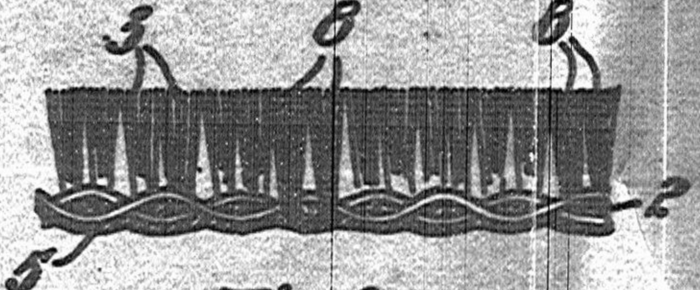


Fig.4.

PATENT SPECIFICATION

Convention Date (United States): Aug. 2, 1940.
Application Date (in United Kingdom): May 28, 1941. No. 6845/41.
Complete Specification Accepted: Nov. 14, 1941.

541,169

COMPLETE SPECIFICATION

Improvements in Pile Fabric Floor Coverings

We, UNITED STATES RUBBER COMPANY, a corporation organized and existing under the laws of the State of New Jersey, United States of America, of Rockefeller Center, 1230, Sixth Avenue, New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to pile fabric floor coverings, such as rugs, carpeting, and the like and, in particular, it relates to pile fabric floor coverings having means incorporated therein for the purpose of preventing or removing an accumulation of static electricity in a body contacting the covering when moving across it.

It is well recognized that as a person walks on a pile rug there is likelihood of a resulting accumulation of static electricity in or on the body and that this accumulation of electricity is discharged when the person touches an electrically conducting body. In some cases the amount of static generated reaches such proportions as to be definitely objectionable. In any event, this static generating condition is always a source of annoyance, and its effect on different people varies in accordance with the temperament of the particular individual. Static generated from rugs is usually increased as the relative humidity is decreased, thus accounting for the more noticeable effect of static during the winter months.

In the practice of our invention we provide a pile fabric floor covering illustrated as a rug, having electrically conducting elements extending from the top to the underside of the rug, in combination with electrically conducting means located at the under side of the rug for the purpose of dissipating a static charge.

Among the objects of our invention are to provide a pile rug having static dissipating characteristics for the purpose of eliminating the annoyance of static shock; to provide in such a rug an electrically conducting means which is resilient, and which does not detract from the appearance of the rug; and, to provide conducting means which may be incorporated with pile rugs efficiently and economically. Other objects and advantages will appear more obvious in the following detailed description considered in connection with the accompanying drawing, in which:—

Fig. 1 is a perspective view of a portion of a pile rug embodying features of our invention;

Fig. 2 is an enlarged end view of a portion of the rug shown in Fig. 1:

Fig. 3 is a similar view of a modified rug: and

Fig. 4 is a similar view of a further modified rug.

Referring to the drawing and, in particular, to Fig. 1 we show a rug 1 of conventional type, consisting essentially of a woven backing 2 from which a pile or nap 3 extends. To provide an electrically conducting medium extending from at least occasional points at the top surface of the rug to a point located at the under side of the backing 2, we provide a cord, yarn or thread 4, treated to make it electrically conducting, in the rug. The cord 4, which may be formed of cotton or other material, is threaded through the rug and along the under side of the backing 2 and again upward to the top surface of the nap or pile 3. The ends of the treated cord 4 preferably terminate at the top surface of the rug as formed by the nap 3. The spacing of these cords is indicated in Fig. 1, and the exposed ends are preferably about two inches apart, although good results have been obtained by spacing the cord ends four or more inches apart.

After the cords 4 are drawn through the thickness of the rug, the under side of the rug is treated to render it electrically conducting. For this purpose a coating 5 of a rubber composition containing electrically conducting carbon black is applied to the under side of the backing 2.

As an example of a material for rendering the cords 4 and the under side of the backing 2 electrically conducting, we prepare a solution of a rubber composition containing the following ingredients:—

	Parts by weight
Rubber – –	100.
Zinc Oxide –	15.
Antioxidant –	.35
Accelerator –	2.
Deodorant –	.1
Stearic Acid –	7.
Sulphur – –	.75

These ingredients are reduced to a cement and .21 pound of this cement is dissolved in 1 gallon of gasoline to which .14 pound of acetylene carbon black is added. The cords 4 may be treated by dipping into this solution and drying to form a deposit on them. The coating 5 on the under side of the backing 2 may be applied by any conventional means such as painting or spraying.

In place of the cement as above described, a latex conducting solution may be prepared, having ingredients, for example, as follows:—

	Parts by weight
60% Latex – –	166.67
Dispersing Agent –	4.25
Activator – –	2.5
Accelerator – –	0.75
Casein – – –	10.0
Ammonia – –	0.9
Sulphur – – –	2.5
Acetylene Carbon Black	85.0
Water – – –	2033.

The sulphur, activator, accelerator, and dispersing agent are mixed together with water and added to the latex containing a dispersing agent. The remaining ingredients, mixed separately, are added to this solution and water is added to reduce the solution to a proper consistency. Coatings of this conducting solution may be applied to the yarns, cords, or sheeting material by operations such as dipping, painting or spraying.

As the cords 4 are exposed at the under side of the backing 2, they engage with the layer of conducting rubber 5 on the backing 2 and an electrical connection is formed therebetween. By this arrangement static electricity which is generated on or in a body passing over the top of the rug, which body forms a contact with one or more of the cords 4, passes through the treated cords 4 and becomes dissipated in the layer of conducting rubber 5. The cords 4 do not of themselves dissipate a static charge unless they engage with the conducting medium 5 underlying the rug and having a capacity sufficiently great to absorb the electrical charge. The layer of conducting rubber composition 5 functions as a condenser and has a sufficiently great capacity to receive and then dissipate accumulation of static by leakage. By spacing the conducting elements or cords 4 throughout the area of the rug, the static is not only discharged from a body contacting the rug, but no substantial accumulation of static is possible because of the frequent displacement of the conducting elements which pass through the rug.

It is to be understood that beneficial effects may be obtained by treating portions, such as edges, of the rug in case it is not desired to treat the entire exposed surface of the rug. It is also to be understood that the rug may be electrically grounded by electrically contacting with any conducting body. Also, the rug may be mounted on a padding, or the like, so long as there is a conducting layer 5 in contact with the threads 4.

In Fig. 3 there is illustrated a modification of the rug in which single threads 6 are threaded through the rug and provided at their lower ends with knots 7, which engage with the conducting layer 5.

In Fig. 4 there is illustrated a further modification of the invention in which certain tufts 8 of the fabric itself have been treated to render them electrically conducting. These tufts engage the backing 5.

Tests have demonstrated that a rug in which one-half was treated in accordance with the present invention and the other half remained in its conventional state, that sparks as long as one-half inch could be produced when the individual walked over the untreated portion of the rug and touched a metal object, while no evidence of a static discharge was apparent when the same individual walked over the treated portion of the rug and touched a similar metal object.

While in the present application reference is made to a pile rug, it is intended to use the word "rug" in its broad sense to include carpets, carpeting, mats, or other types of floor coverings having a pile formed essentially of textiles of a vegetable, animal, or synthetic origin.

As thus shown and described, it is believed apparent that we have provided a unique and efficient means for discharging accumulation of static, and while we have shown preferred embodiments of our invention, it is to be understood that it is susceptible of other modifications, as appearing within the scope of the appended claims.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A pile fabric floor covering having means forming an electrically conducting path extending from the top to the under side of the covering in combination with electrically conducting means in contact with the aforesaid means at the under side of the covering.

2. A pile fabric floor covering, a coating of a flexible electrically conducting material adhered to at least a portion of the under side of the covering, and a plurality of electrically conducting elements contacting said coating and extending to substantially the top of the covering.

3. A pile fabric floor covering according to claim 2, wherein the electrically conducting elements are of rubber composition.

4. A pile fabric floor covering substantially as hereinbefore described and illustrated in Figs. 1 and 2.

5. A pile fabric floor covering substantially as hereinbefore described and illustrated in either of the modifications of Figs. 3 and 4.

Dated this 12th day of May, 1941.

T. A. CLAYTON,
Acting for Applicants.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1941.

Ayrton et al
Pat 546802

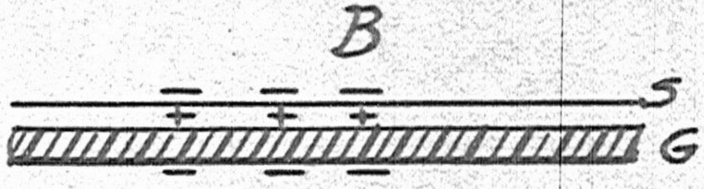


Fig. 1

Plaintiff's EXHIBIT NO. 2

CA 4362-49

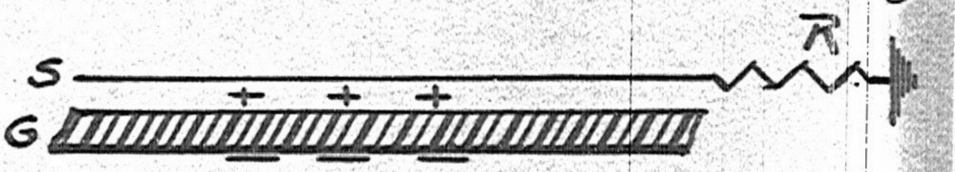


Fig. 2

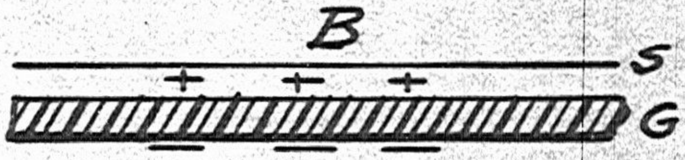


Fig. 3

FILED
MAR 22 1951
HARRY M. HULL, CLERK

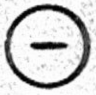


Fig. 4

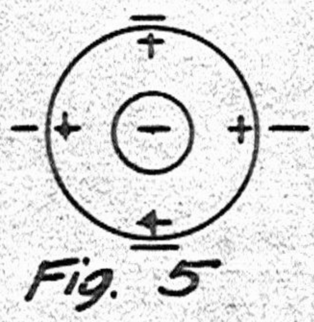


Fig. 5

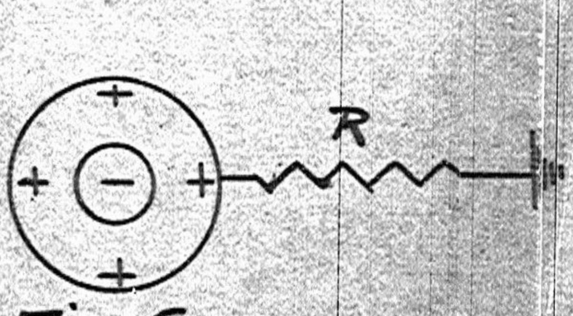


Fig. 6

Peterson ppr
Ser. No. 510256

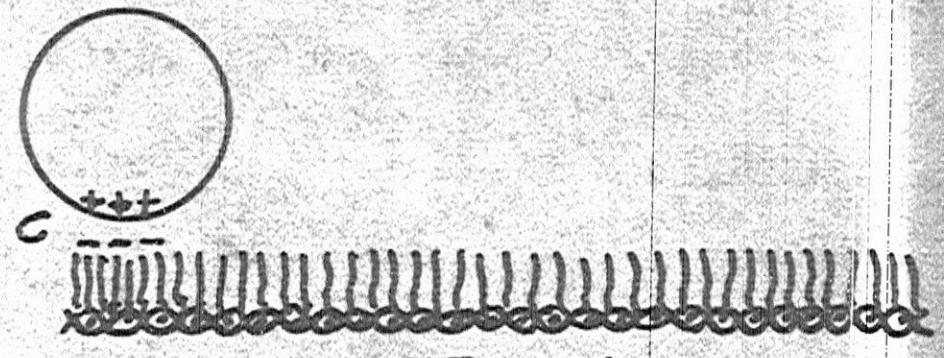


Fig. 10

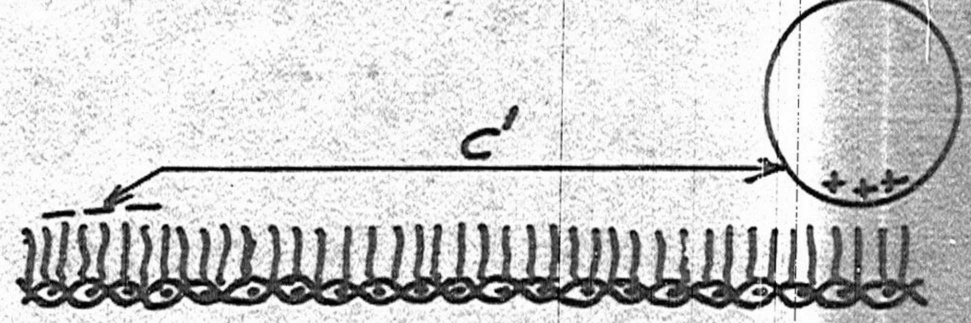


Fig. 11

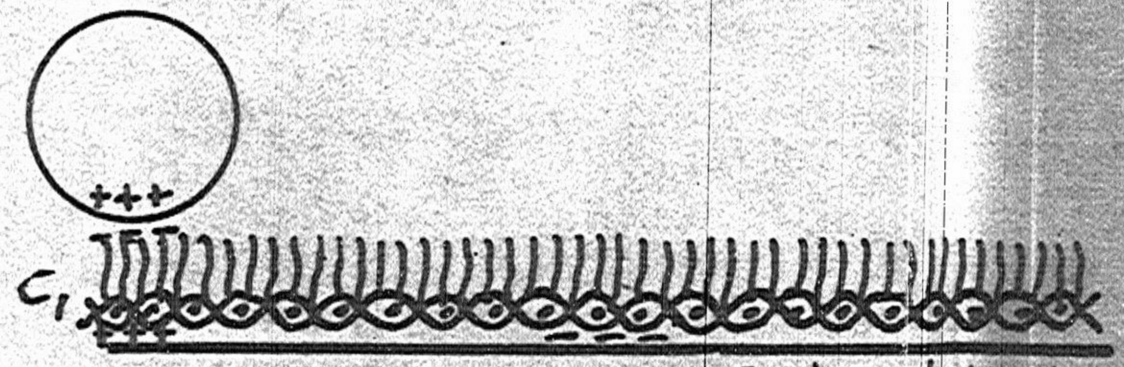


Fig. 12 Semi-Conducting Layer

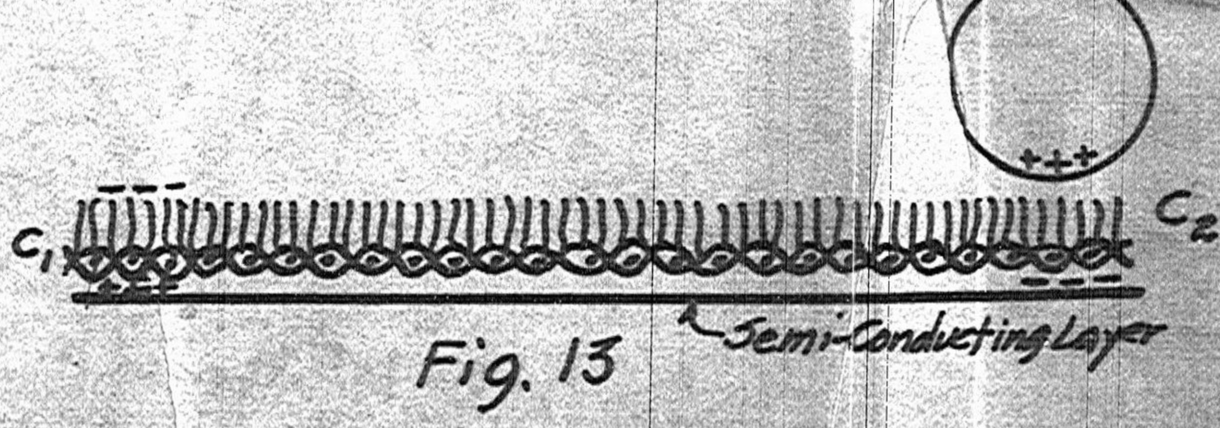


Fig. 13 Semi-Conducting Layer

No. 11,131

BRIEF FOR APPELLANT

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

United States Court of Appeals
For the
District of Columbia Circuit

FILED SEP 14 1951

Joseph W. Stewart
CLERK

THOMAS F. PETERSON, *Appellant*,

v.

JOHN A. MARZALL, Commissioner of Patents, *Appellee*.

Appeal from the United States District Court for the District of Columbia

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WILSON - EPES PRINTING CO. - RE 6003 - WASHINGTON 1, D. C.

No. 11,131

APPELLANT'S STATEMENT OF QUESTION PRESENTED

The question is whether, in an action against the Commissioner of Patents for the issuance of a patent, the evidence of novelty and inventiveness submitted on behalf of the plaintiff did not clearly and convincingly establish that the refusal of the Commissioner to issue a patent was erroneous.

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In The

United States Court of Appeals

For the District of Columbia Circuit

No. 11,131

THOMAS F. PETERSON,
23450 Laureldale Road,
Shaker Heights, Ohio

Appellant

v.

JOHN A. MARZALL,
Commissioner of Patents,
Washington, D. C.

Appellee

Appeal from the United States District Court for the District of Columbia

---

BRIEF FOR APPELLANT

JURISDICTIONAL STATEMENT

This appeal arises from a decision of the District Court of the United States for the District of Columbia dismissing a complaint brought by Thomas F. Peterson against John A. Marzall (substituted for Lawrence C. Kingsland) in his official capacity as Commissioner of Patents of the United States Patent Office for the issuance of a patent on an application of said Peterson.

The District Court had jurisdiction of the complaint under the provisions of the Revised Statutes, Sec. 4915, U. S. C., Title 35, Sec. 63 (App. 2). This Court has jurisdiction of this appeal under the provisions of U. S. C., Title 28, Sec. 1921.

STATEMENT OF THE CASE

The Complaint prays that the Commissioner of Patents be directed to allow claims 21, 22 and 23 (complaint, paragraph 8, App. 4) defining the invention disclosed by the plaintiff in an application Serial No. 510,256, filed in the United States Patent Office on November 13, 1943, for improvements in "Non-Static Structures", and to issue to the plaintiff a patent thereon containing the said claims.

As set out in paragraph 7 of the complaint (App. 3):

> "The invention involved in this proceeding relates to an electrically insulating layer structure, such as a floor rug, that is subject to frictional generation of static charges by a body moving over an exposed surface, and made non-static in effect by a combination with a second layer of semi-conductivity coextensively contacting the non-exposed surface of the insulating layer and preventing any material increase in potential difference between a charge generated in the rug (or other insulating structure) and its opposite charge on the generating body upon lateral separation of the two charges; the semi-conductivity of the second layer also insures against accidental conductance of harmful currents."

The claims were finally rejected by the Examiner (App. 65) as unpatentable over a joinder of two patents:—

U. S. Rubber Br.	541,169	(App. 79)
Ayrton U. S.	546,802	(App. 75)

The rejection was supplemented by a reply to the plaintiff's brief before the Board of Appeals (App. 67).

The final rejection of the claims was affirmed by the Patent Office Board of Appeals (App. 70) on the joinder of the same two patents. A request was made to the Board of Appeals to reconsider the affirmance, submitting in support an affidavit setting out an expert's opinion concerning the references and their pertinency; consideration of the affidavit was refused and the request denied.

In his answer to the complaint (App. 7), the appellee herein relied on the reasons given in the Examiner's Statement and reply to the brief and on the decision of the Board of Appeals in view of the foregoing two patents.

At the trial in the District Court evidence not available in the record (App. 13-50) was presented on behalf of the plaintiff to establish the novelty and usefulness of the invention and as one dependent on an application of principles not utilized or recognized by the references singly or jointly.

The District Court, however, agreed with the conclusion of the Board of Appeals (App. 10) and dismissed the complaint (App. 12), holding the claims unpatentable as not requiring the exercise of invention over the combination of the two references.

STATEMENT OF POINTS RELIED ON

Appellant contends that the decision of the District Court is erroneous as a matter of law, because of the uncontradicted testimony and evidence offered at the trial by the appellant shows beyond any reasonable doubt that the structure claimed embodies in useful form a principle of operation not disclosed or suggested by the combination of the two prior art patents and one leading to a novel and useful simplification of structure over prior art attempts to achieve the same result.

SUMMARY OF THE ARGUMENT

Simple as the invention is—(a) a layer of material that is insulating, i.e., non-conducting and static-generating upon friction, such as a rug, and (b) a semi-conducting layer in contact with a surface of (a) not exposed to friction—no anticipation can be constructed by combining the two references; this is clearly established by the uncontroverted testimony of the expert, Prof. Balsbaugh and of Mr. Peterson, himself an expert, which shows that the Patent Office decisions were based on clearly erroneous interpretations of the disclosures of the two references, and that the principle of operation embodied by the invention is not to be found in those references. This uncontroverted evidence, which was not before the Patent Office tribunals, is submitted to be of such character and weight as to require the District Court to find the Patent Office decisions to be erroneous.

SUMMARY OF THE EVIDENCE

A brief summary of the evidence offered on behalf of appellant by the two witnesses follows.

Prof. Balsbaugh (App. 14), a professor of electrical engineering at Massachusetts Institute of Technology and consulting engineer particularly well versed in the field, to which the present invention pertains, analyzed the references and their relation to the subject matter in issue, leading to the inevitable conclusion of the absence of anticipating disclosures.

Mr. Peterson, the inventor, (App. 34) explained the background leading to his concept and described the making of actual tests that demonstrated the surprising new results that followed from the omission of electrical contacts in the surface of a rug heretofore believed necessary according to the prior art.

STATE OF THE PRIOR ART

The problem to which the invention in issue is directed and long recognized as existing in the prior art is that of static charges generated by the friction of one body on another, and typically charges resulting from a person walking over a rug or other insulating floor covering. The friction of the shoes on the rug creates static charges, one on the rug surface and another of equal quantity but opposite polarity on the person. The person carries his charge (or charges) until he touches some conductor to ground, such as a radiator, doorknob, etc., whereby he is discharged. On a cold dry day, these discharges are likely to appear as sparks from the finger tips in reaching to touch the conductor, causing shock and a definite hazard of fire, particularly in an explosive atmosphere. The third paragraph of the British patent description (App. 79) is in substantial accord with the foregoing.

The prior art approach to the problem is that disclosed by the second paragraph of the British patent, namely, preventing or removing any accumulation of static on the *person* (App. 79). Such elimination of static is accomplished by providing electrically conducting means coming into *direct* contact with the person; in the British patent these conductors are cords or tufts 4 of conducting material extending to the top of the rug and conductively connected with a conducting layer 5 on the underside of the rug (App. 79, lines 37-45; lines 73-79;

lines 88-89; lines 93-99). Any charge generated on the person passes into the cord 4 upon contact therewith by the person and becomes dissipated in the layer 5 (App. 80, lines 48-54); the dissipation occurs through leakage (App. 80, page 2, lines 60-63), and the only leakage possible is that to ground. By spacing conducting elements throughout the area of the rug, static is not only discharged from a body but no substantial accumulation of static on the body becomes possible (App. 80, lines 65-71). The patent accordingly *prevents* accumulation of charges and *removes* any possible charges that may form by providing *conductors* to *contact* with the person.

APPELLANT'S INVENTION

From his testimony, it is evident that appellant has long been familiar with static charges and their problems (App. 34-36). Two simple approaches to the problems are: (1) to prevent a static charge from developing as by wetting the floor covering or making a metal floor out of it, and (2) draining away any charge to earth (App. 36, 37) by direct contact with conductors. But he wanted something that did not require modifying or discarding the ordinary rug structure, and he reasoned that it was not the presence or the magnitude of the charge on the person that was the source of trouble but its potential (App. 37). His concept therefore was to let a charge develop and remain, but to control the potential of the charge so that harmful or objectionable sparking could not occur, giving as an illustration the separation of clouds (App. 37). This he succeeded in accomplishing simply by placing under a rug a layer of cloth, paper, etc. that electrically had no conducting connection with the top surface. Repeated comparative tests showed that without the layer sparks developed, but under the same conditions and with the layer no sparking was observable; his affidavit is to this effect (App. 38).

Moreover, he had another objective, and that was overcoming the hazards associated with wires or other good conductors. Even though the layer be on the underside and insulated by the rug, there is still the danger of short circuits when the layer is a good conductor. In his testimony, he refers to two such hazards: (1) a baby wetting the rug and accidentally poking a wire into a base plug could be electrocuted under such conditions; and (2) a good conductor underneath, or with contacts extending to the surface (as in the British patent), might become alive, if not well grounded, by contact with a lighting circuit, and in such a case, a person not sufficiently insulated from the layer could, by touching a grounded object, become severely burned or even electrocuted. When the layer is semi-conducting, however, no such possibilities can exist, since it will not carry enough current at the normal house voltage (110 volts) to cause harm (App. 39). At the trial a demonstration showed the impossibility of shorts (App. 40).

APPLICATION DISCLOSURE AND CLAIMS

No question has been raised as to the sufficiency of the specification disclosure (App. 51), but it seems desirable to draw attention to the many useful applications that can be made of the invention, as set forth therein, and the structural simplifications that follow, accomplished by the simple provision of a loose or attached semi-conducting layer or surfacing on the underside and with no exposed electrical conductors and thus avoiding the dangers and difficulties inherent in conducting elements. It, moreover, makes clear the underlying operating principle (App. 52) of the invention.

The actual practice of the invention is set out in an affidavit outlining the comparative tests that were made (App. 58).

The three claims refused by the Patent Office are directed to a combination of:

(a) a layer electrically non-conductive laterally and in depth, exposed on one surface to frictional static-engendering contact by a body moving thereover and creating an electrostatic charge on the layer and an opposite charge on the body subject to increase in potential between the charges upon separation, and

(b) a second layer of semi-conductivity in substantially coextensive contact with the non-exposed surface providing for induced charge leakage laterally in the direction of movement to prevent substantial increase in the potential between the charges,

(c) the semi-conductivity being of a character to insure against accidental conductance of harmful current amperage.

Claim 21 is limited further in the layer (a) being textile floor covering. Claim 22 is to the layer (a) of flexible material. Claim 23 is limited to the layer (b) being a non-metallic layer.

THE PRIOR ART PATENTS

British 541,169

The principal reference—British 541,169 (App. 79), is directed to the problem of

> "preventing or removing an accumulation of static electricity in a body contacting the covering when moving across it." (App. 79).

It is dependent on the provision of conducting cords or tufts 4, 6, 8 extending from the top surface of a rug and through the rug to a conducting backing 5 for the rug; it is therefore open to the objections of requiring specially woven conducting structures that, in addition, present the hazards of short circuits. These cords are closely spaced (about two inches apart), and the layer 5 functioning as a condenser has

> "a capacity sufficiently great to absorb the electrical charge. The layer of conducting rubber composition functions as a condenser and has a sufficiently great capacity to receive and then dissipate accumulation of static by leakage. By spacing the conducting elements or cords 4 throughout the area of the rug, the static is not only discharged from a body contacting the rug, but no substantial accumulation of static is possible because of the frequent displacement of the conducting elements which pass through the rug". (App. 80)

Ayrton et al 546,802

The ancillary reference—Ayrton et al 546,802 (App. 75)—, combined with the British patent, provides a screening for measuring instruments which

> "have their indications or records temporarily altered when the glass which covers the pointer or working part is cleaned, owing to the glass being electrified by the cleaning process, and electrical instruments on high potential circuits are influenced when the hand or other conductor whose potential differs considerably from that of the working parts is brought near. To prevent these alterations we use a conducting-screen; but instead of employing sheet metal foil, wire netting or gauze, which has hitherto been customary, we form the screen in such a way as to be transparent or translucent in order that no portion of the working parts, pointer or other indicating mechanism or device is obscured by the presence of our screen".
>
> In some cases the screen is formed on the inside of the glass or other transparent cover whereas in

> other instances the screen is outside the glass or separate therefrom." (App. 76).

This transparency is accomplished, e. g. by smoking the glass lightly to provide a film of carbon, by depositing metallic films, or by a dried coating of acidified gelatine.

From the description it is apparent that the location of the screen is immaterial, as it can be on the inside or the outside of the glass; and the source of the disturbing influence is not material, for it may be created by electrifying the glass or brought near the glass by the hand or a conductor. The sole objective is that of shielding the instrument from such an influence, and this is accomplished by the conducting film or coating—inside or outside the glass—terminating the field of action of the influence, e. g., the disturbing effect of a charge.

It is significant, moreover, that the Ayrton et al patent was granted in 1895, and in all the intervening period to the filing of the instant application (Nov. 13, 1943), the art for discharging static from floor coverings clung to the conductive connections extending to the surface as shown by the British patent (based on an U. S. application filed Aug. 2, 1940 that became a patent 2,302,003 on Nov. 17, 1942). Evidently the Ayrton patent has made no impress over the almost sixty year period following its grant to the time of filing the Peterson application.

THE PATENT OFFICE ACTIONS

In evidence, as defendant's exhibits 1, D, E, F and G, are the Examiner's Statement (App. 62), his reply to brief (App. 67), the Board of Appeals decision (App. 70), and answer to a request for reconsideration (App. 73). The prior art references are the two patents, defendant's exhibits A and B (App. 75, 79).

The Examiner's Rejection

The Examiner's position is that coating 5 of the British patent need not be grounded, (though the patent says it can be and draws no distinction between the presence or absence of grounding), and "will act capacitatively to prevent static electricity" (App. 65). He admits the patent provides conductors 4, 6 and 8 connected directly to the layer 5, which the applicant omits, but

> "The applicant has not alleged any facts that would suggest that his rug constitutes an improvement over a rug similar to the British patent or that his rug functions as a protection against static electricity better than the rug of the patents." (App. 65, 66)

This he explains further by stating that in the British patent

> "the coating is capacitatively connected with the ground" (App. 66).

A typical condenser consists of two conducting metal plates with a dielectric or non-conducting material, such as paper, between them. According to the Examiner in his reply (App. 67) to appellant's brief before the Board of Appeals:

> "Obviously the layer 5 of this British patent is one plate of a condenser, the other plate being the ground. The patent goes on to say that the rug may be mounted on paddings so long as the layer 5 and the threads 4 are in contact. If the layer 5 is a condenser as stated, it is obviously capacitatively connected with the ground ——. It is stated further that the rug may be electrically grounded by electrically contacting with any conductor body. —— In this case the layer 5 would not act as a condenser nor would it be capacitatively connected with the ground, but the connection would be direct. The disclosure where the layer 5 is directly connected to

> ground is a different but equivalent one." (App. 67).

But what material bearing has the presence of a "condenser" between the layer 5 and the ground on the preventing or the draining of any possible charges on the person into the layer 5, which is the objective of the British patent through the medium of the cords 4 extending upward from the layer 5? The charge on the person, if any, having been removed into the layer 5, its further disposition is immaterial, whether it be by way of a "capacitative connection" to ground or by a direct conducting connection to ground; the British patent itself makes this evident by stating that either connection can be used as the Examiner admits (App. 67).

It is upon his interpretation of a "condenser" in the British patent meaning one employing a capacitative connection between the coating 5 and the layer, however, that the Examiner rests his case for substitution from the Ayrton et al patent (App. 66). The latter patent, he says, "employs a capacitative connection between the moving object on the glass and the coating on the opposite surface", arguing

> "The essence of the disclosure in the Ayrton patent is that a conductive coating is put on one surface of a body of insulating material for the purpose of preventing static which results from an object being moved over the opposite surface". (App. 66)

But that this is not the essence or even contemplated by the Ayrton patent is evident from the fact that for the purpose of the invention the Ayrton coating or screen S can be on the front as well as on the back of the glass, the operation being the equivalent in either case; as the Examiner himself says:

> "The patent teaches that the static may be prevented by placing a coating of conductive material on the opposite inner surface, within the glass (Fig.

> 4) or on the outer exposed surface. In the first two the coating is related capacitatively to the static generating member; in the third case the relation is one of direct contact. Either one may be used." (App. 68, 69).

Evidently, however, in the third case mentioned there can be no static generated, since the surface rubbed is the coating which is a conductor, not a dielectric. Yet according to the patent and the Examiner's statement, it is equivalent in operation to the first case. There is then no teaching in the patent of *preventing static* by the coatings S, but instead one of avoiding the *effects* of a charge or field, such as a hand or conductor brought near the instrument, the hand or conductor brought near the instrument certainly does not generate static. What the patent contemplates and accomplishes is in its own words:

> "to completely screen them (the instruments) from such influences without hiding the pointer" (App. 77);

and for this purpose the location of the coating and the generation of static are immaterial.

Returning to the Examiner's assertion that the Ayrton et al patent "employs a capacitative connection between the moving object on the glass and the coating on the opposite surface", there is nothing to be found in the patent concerning such a connection. If present at all, it is clearly incidental, since the moving object is withdrawn from the vicinity of the instrument so that any charge that may be thereon is devoid of any noticeable effect on the instrument, with or without the presence of the conducting screen to block its field.

Moreover, it does not necessarily follow, as the Examiner's assumption requires, that there is a charge fixed on the moving object, i.e., the rubber cloth, to provide the "capacitative connection". Since the cloth is grasped in the hand and the person rubbing the glass is usually grounded, it is more reasonable to assume that any electrical charge generated on the cloth flows off to ground as fast as it accumulates. In the absence of any reference thereto in the patent, the assumption of the existence of a charge on the cloth and the consequent existence of a "capacitative connection" are therefore not warranted.

Board of Appeals Decision

With regard to the Ayrton patent the Board of Appeals in its decision held in substance that there is nothing in it to show that to *shield* a meter, though it is customary to connect a shield to the grounded casing, means that the screen of the patent is intended to function in this matter, and that the patent is operative without a grounding connection, stating.

> "In Fig. 4, for example, the semi-conducting coating 5 would dissipate any potential charge which would tend to collect on the rear surface of the front glass of the cover and thus prevent the building up of a high potential on the front surface of this glass. Since no connection to ground is disclosed and since their method is operative without such connection, we are of the opinion that Ayrton et al did not intend to rely on such a connection". (App. 72)

The Board failed to take into consideration the Examiner's interpretation of "condenser" in the British patent, and it summed up the rejection as follows:

> "Since it is old in the art to prevent the building up of static charges by direct electrical connection to a dissipative coating, as shown by the British patent, or by a capacitative coupling to a dissipating coating, as shown by Ayrton et al, we are of the opinion that it would not require the exercise of invention to select either method to prevent the accumulation of static charges generated on rugs or similar objects. The two methods are functionally equivalent." (App. 72)

The issue thus presented is evidently one of fact as to equivalency in the functioning of the Ayrton and British patent disclosures, and their relation jointly to the application in issue. The Board holds that it is only a matter of dissipating and preventing the accumulation of charges "generated on rugs or similar objects" and that that is all the applicant does. The only recourse left to the applicant accordingly was to supply evidence and establish that there is a difference in function and in principle of operation resulting from a difference in structure over the references and, accordingly, the complaint was filed under R.S. 4915 for this purpose. (App. 2)

THE EVIDENCE

Operating Principle of the Invention

The position of the Patent Office rests on the contention that both of the references show dissipation and elimination of charges on the *glass* or on the *rug*, the latter (British patent) accomplishing this by direct contact and the former (Ayrton patent) by "capacitative coupling". But dissipation and elimination of charges are not the objective or the function of the structure here in controversy; these remain. Prof. Balsbaugh was asked to explain what takes place, using a chart (App. 84) for illustration.

In Fig. 10 of the chart (App. 20), a body (represented by the circle) is shown as having imparted electrons or a negative charge to the face of a rug to leave a positive charge or absence of electrons on the body; the slight separation of these charges results in the capacitance C, and because the rug is insulating, the negative charge on the rug remains fixed. Consequently, upon further separation, as shown in Fig. 11, the capacitance C is decreased to C′ (the capacitance varies inversely with the distance between the charges), but the quantity of electricity Q remains the same. But, as Prof. Balsbaugh points out, this quantity Q is equal to the capacitance C times the voltage E, and as C decreases E must increase in proportion (App. 21). The increase in voltage can very easily be fifty to one-hundred thousand volts (App. 22). It requires only 35,000 volts to pull a spark one-half inch long in air, so the danger of sparks in an explosive atmosphere is manifest; this has occurred, for example, in hospitals and powder loading plants (App. 23).

All this, however, is fundamentally changed when a semi-conducting layer is placed under the ordinary rug, the subject matter of the application under consideration; this is illustrated in Figs. 12 and 13 of the chart (App. 24). With such a layer, a new capacitance C_1 is set up, the electrons in the layer being repelled by the negative charge on the rug surface to leave a positive charge on the interface of the layer; the electrons (negative charge) at the interface are thus free to drift elsewhere as shown. Now when the body with its positive charge is separated from the negative rug charge, a second capacitance C_2 is formed between the body charge and the drifting negative interface charge as illustrated in Fig. 13. The total capacitance is then down from the body to the interface C_2 through the semi-conducting layer and up from the interface to the rug surface C_1. This capacitance remains constant with lateral movement over the rug, and as Q is constant, the voltage E remains constant. (App. 24) The charges on the body are *not* dissipated or drained off, but the voltage does not increase to create sparking potentials, and the body can then discharge its positive charge without any noticeable effect.

That the Peterson application differs in principle of operation from both the references necessarily means there must be some difference in structure, and this is so. Grounding, direct or indirect (as hereinafter discussed), is necessary to the operation of the Ayrton screen S (which is conductive and not semi conductive), and the conducting tufts 4 are essential to the British rug. With the negative charge eliminated from the Screen S of Ayrton by grounding, the two charges remaining on the glass neutralize each other so their effect on the instrument is zero (App. 31); and the tufts of the British patent are the same as walking on a conducting rug (App. 32). Both of these structural features are absent from the Peterson structure and preferably so because of the hazards they introduce when applied to a rug or similar floor- or seat-covering.

Ground Connection

It is clear from the Ayrton patent (App. 75) that the intent of the patent is to provide a *substitute* for the metal screening "hitherto customary" in the form of a transparent conductive coating on the glass; such screening is grounded, as the Board admits, but it concludes

> "Even though it was customary in the past to *shield* a meter by placing foil, wire netting, etc. over the front of the instrument and connecting it to the casing there is nothing in Ayrton et al to positively show that his screen functioned in this manner." (App. 71)

This conclusion is drawn by the Patent Office in the face of the patent statement that it is a screen like those "hitherto customary", the only difference being that it is made transparent.

Accordingly, Prof. Balsbaugh was called on to explain the term "shielding" and its import (App. 16); to do this he made use of a chart (App. 82). In Fig. 1 of the chart is shown a negative charge (———) or electrons left on the face of the glass C and produced by rubbing with a cloth. The result is a repulsion of electrons on the screen S giving equal positive and negative charges on the surfaces of the screen. The sole purpose of the screen S is to prevent setting up an electric field that will influence the measuring instrument B behind the glass, and the only way this can be done is to remove the negative charge or electrons from the screen S, which can only take place by the negative charge flowing off to ground. (App. 17) Such instruments are always grounded, otherwise the screen would not operate (App. 18). The ground does not have to be a direct connection; even with a resistance R (Fig. 2) of millions or billions of ohms to ground, the charge would flow off in a thousandth of a second or less (App. 19).

The sum and substance of this testimony is that a ground and elimination of the negative charge on the screen are essential to the operation of the Ayrton screen S and occur without any direct metallic connection and with a high interposed resistance R of the order of millions of ohms. With grounding and elimination of the negative charge on the screen S, the electric field is then wholly confined to the glass G which is the sole objective of the Ayrton patent.

Peterson also discussed the shielding and particularly its "effect" in the Ayrton patent. In this connection, he gives a watch as an illustration, the difference being that Ayrton is concerned with very delicate pointers that are affected by the charge on the glass (App. 41). This is the effect that the patent eliminates by the conductive layer of soot or equivalent acting as a drain to ground (App. 43, 44). He makes further the pertinent inquiry that, if the Ayrton patent (granted 1895) is the solution of the static problem, why is it that someone hadn't done something about it before he came along with his solution (App. 45).

Capacitative Coupling

Fundamental to the rejection by the Board of Appeals is the assumption of a "capacitative coupling" as existing between the screen S and the charge when on the front of the glass in the Ayrton patent and its equivalency to the electrically conductive connections (cords 4) of the British patent.

To begin with, the expression is meaningless where direct current or static electricity phenomena are involved. Moreover the two terms—capacitative and coupling—appear conflicting, for "coupling" infers a conductive connection along which electrons can freely flow (such as the cords 4 of the British patent), while "capacitative" requires a condenser dielectric that blocks electron flow to build up static charges on the dielectric surfaces. As Prof. Balsbaugh explains the Ayrton patent, rubbing the surface of the glass (a dielectric) leaves a deposit of electrons (negative charge) that remains on that surface, i.e., one that does not flow off the surface; this negative charge exerts a force that pushes electrons in the conducting screen 5 to the rear surface leaving an absence of electrons or a positive charge on the front of the conducting screen.

Assuming the presence of negative and positive charges on the front and rear surfaces of the glass, the glass being a dielectric, it may be said that there is a capacitative action under these conditions. But it is clear from Prof. Balsbaugh's testimony that, since the screen S is conducting and the negative charge thereon flows off to ground to thereby shield the measuring instrument, the presence of the equal negative and positive charges on the glass is of no moment whatsoever, and whether or not there exists in the Ayrton patent a condenser or "capacitative coupling" is wholly immaterial to the issue. It has nothing to do functionally with any positive charge, if any, that may be left on the cloth by the rubbing of the glass therewith.

In this connection, it is emphasized in the present invention, that when a *lateral* movement of the body or person over the rug surface takes place, no substantial increase occurs in the potential difference between the person charge and the rug charge, as explained by Prof. Balsbaugh (App. 24). There is no counterpart to this in the Ayrton patent.

It furthermore follows then that there can be no equivalency between the conducting cords 4 of the British patent and the "capacitative coupling" (whatever it is) of the Ayrton patent. The cords 4 drain the charge from the person into a reservoir layer 5 having sufficient capacity to absorb the charge. The Ayrton structure has no expressed cooperative function with a charge on the cloth but only the one of shielding the instrument from the charge on the glass.

Condenser Action in the British Patent

Since the Examiner laid great stress on the presence of a condenser being formed in the British patent by the layer 5 and the ground (which the Board of Appeals apparently discounted), due to the use of the word "condenser" occurring in the patent (App. 80), Peterson was questioned. He testified that any condenser action or effect is of a very transitory character, since the layer 5 has only such "capacity" that allows it "to receive and then dissipate accumulation of static by leakage". (App. 43). A charge draining from a person to the layer 5 does so instantaneously, and even when it occurs the condenser action is of extremely fleeting character, since the charge leaks off in a thousandth or millionth of a second. (App. 43) In this connection, however, the patent itself indicates very little if any accumulation of static charges can occur because of the drainage through the tufts; as the patent says, such accumulation is to be prevented. The possibility then of a condenser action is very slight and of little if any moment.

Semi-Conducting Layer

At the trial Peterson made a demonstration test of a semi-conducting layer with a light operating at 110 volts and indicating a high resistance by the dimming of the light as the contact points were separated. This shows its effectiveness in preventing harmful currents flowing through it at the normal house voltage and therefore the avoidance of shorts and the absence of any need for grounding or for draining away a charge on the body. (App. 40)

There is nothing in the prior art references to a semi-conducting layer. It is true that the British patent adds conductive carbon particles to rubber latex and the Peterson layer can be rubber including such carbon particles. But Peterson uses only from thirty-five per cent, giving a resistivity of 10^7 ohms per cm^3, and an increase in particle content reduces the resistivity to 10^3 ohms per cm^3 (Peterson specification, page 4, lines 5-27). The British patent, however, in the example, uses eighty-five per cent of carbon particles on the weight of rubber (166.67 parts of 60% latex equals 100 parts of rubber) which obviously gives a much less resistance, and according to the patent, a layer falling in the conductive range. In this patent disclosure, there is accordingly no recognition of a semi-conductive layer.

Nor is there any need for it in either reference, for both seek to *conduct* away the charge; for this purpose, the greater the conductivity, the better the layer becomes. The Ayrton patent says a deposit of carbon soot makes an efficient screen and one evidently of the same order as a metal deposit with which he classifies the soot (App. 41); Peterson, by the way, testifies to the impracticability and inoperability of such a layer for a rug structure, which further is indicative of a lack of pertinency to the structure in issue (App. 41). Obviously high conductivity is the aim of the British patent in seeking to prevent any accumulation of charges.

Accordingly, it seems clear that neither patent discloses or contemplates a semi-conducting layer as called for by the claims. Yet it is upon this characteristic that the function of avoiding short circuits is dependent in the event of accidental contact, through wetting or otherwise, with the layer under the rug.

THE FINDINGS OF FACT

The critical findings of fact of the District Court are those numbered 3, 4 and 6 which in substance are identical with the holdings of the Board of Appeals.

Finding No. 3

In finding No. 3, (App. 11) relating to the Ayrton patent 546,802, it is stated that

> "there is a capacitative coupling between the static charge on the front of the glass and the dissipating coating or screen on the back of the glass."

A conflict in terms here appears again in stating that a "coupling" exists between an electrical charge and a coating; the coating is a material element, while the charge is not. But assuming the intent to be that of a coupling of two opposite charges, one on the front and the other on the back of the screen, the term "coupling" still seems meaningless, for there is no coupling in the sense of a connection between the two charges. But, however this may be, the existence of such a capacitative effect can have no relevancy to any potential difference created by pulling a rubbing cloth away from the glass surface, again assuming a charge fixed on the cloth for which there is no supporting disclosure or valid reason. Evidence bearing on this question is discussed above (pages 19, 20).

Finding No. 4

In finding No. 4 attention is directed to the statement in the British patent 541,169 that the layer or coating 5 functions as a condenser with capacity sufficient to receive and dissipate accumulation of static by leakage. What condenser action may take place must be very slight and of little moment, since any charge conducted into the layer from the person immediately is drained to ground by leakage as the evidence shows (this brief, p. 20). It is without relevancy to the present invention, which does not draw off the person charge but leaves it on the person.

Finding No. 6

In finding No. 6 the Board of Appeals' position is repeated as to the equivalency of a

> "direct electrical connection to a dissipative coating, as shown by the British patent"

and

> "a capacitative coupling to a dissipative coating as shown by Ayrton et al."

No exercise of invention is said to be required

> "to select either method to prevent the accumulation of static charges generated on rugs or similar objects."

This finding draws an immaterial conclusion that has no relevancy to the issue. The objective of the present invention as has been contended all along, is not the prevention of the accumulation of the rug charge, nor of a body charge for that matter. The structure here is not one that drains away a body charge, for there is no provision for that purpose; there are neither conducting tufts, as in the British patent, nor a ground connection, necessary to the Ayrton operation. In the absence of such elements or their equivalents, prevention or dissipation of charges is not the function exercised by the invention. Yet it is obviously upon the assumption of the exercise of such a function that the rejection depends.

SUMMATION

The subject matter claimed is a structure composed of two layers: (a) a top layer of insulating, i.e. non-conducting, material such as a rug, and (b) a semi-conducting layer under the top layer of a character insuring against conductance of harmful current amperage. It is exemplified by a rug with a semi-conducting cloth, paper or coating on the underside, loose or attached, whereby any static changes generated on a person by walking on the rug, is kept from developing a sparking voltage. Simple as it is, it is submitted that no disclosure is to be found in the two references relied on by the Patent Office, singly or in combination.

The basic reference, British Patent 541,169 (App. 79) shows a rug structure with conductive tufts or cords woven into it and extending to the rug surface; these are spaced about two inches apart and are connected by a conductive layer 5 on the bottom of the rug and a part of the rug itself. Mention is made in that patent of a "condenser", which the Examiner interprets as one formed by the layer 5 and the ground; but this has no material bearing as pointed out herein (supra p.).

The other reference is a U. S. patent to Ayrton et al (App. 75) that shows a screen for an electrical measuring instrument differing from prior metal screens in being wholly transparent; this it purports to accomplish by providing a glass cover, which has on the front or back a coating of soot, metal, etc. that is conductive.

The position of the Patent Office, as expressed by the Board of Appeals, is that the British patent shows conductive elements that contact a person walking over a rug and thus prevent or remove any charge carried on the person as a result of scuffing the rug. The Ayrton et al patent is alleged to have a "capacitative coupling" of a charge generated on the glass with the "dissipative coating". It alleges that all the applicant has done is to substitute the Ayrton coupling for the tufts of the British patent, the two "methods" being equivalent.

The controversy may be said to center about the Ayrton patent, since it is clear that the Patent Office does not rely on the British patent as an anticipation per se. As to the Ayrton patent, there is one element of its combination which the Board of Appeals maintains is not necessary or present, though admitted as customarily present, and that is the connection of the screen to ground. The patent itself says that the glass with the coating thereon is a "conducting screen" and used instead of sheet metal, foil, wire netting or gauge hitherto customary; and the objective of the patent is that of screening an electrical instrument from the effects of a charge generated by rubbing or a field brought near the instrument. For this purpose, the Balsbaugh testimony (supra pp. 17, 18) is submitted as proving conclusively that a connection of the glass screen to ground is necessary in order to operate as a shielding screen and that such a connection exists even with no direct connection to ground and an interposed resistance of millions of ohms; otherwise there would be no object in providing the glass with a conductive coating, since there would be a charge on the back of the coating affecting the instrument just like the one on the glass front, illustrated in Fig. 1 of the chart (App. 82). The presence of such grounding entirely alters the functioning of the screen, for all that can remain are equal and opposite charges on the glass that reduce any ulterior effect to zero (Fig. 3, App. 82).

That the Ayrton et al screen functions to conduct away any charge is further evidenced by the fact that the location of the screen is immaterial. It can be on the front of the glass, in which case, as the Examiner says, there is direct contact and therefore no charge generation or "capacitative connection" (supra p. 12).

The foregoing shielding or screening function is not at all that of the invention in issue, and its principle of operation is fundamentally different. (Supra pp. 15-17) There is no dependence on drawing away or eliminating charges through conductive means characteristic of both the British and the Ayrton patents. Here there is a capacitance C (Fig. 10, App. 83) as a result of a charge on the rug surface and the equal and opposite one on the person, and with the usual rug there develops a high voltage upon separation of the charges, due to the decrease in capacitance C′ (Fig. 11, App. 83). By the placing of the semi-conductive layer under the rug there is developed a capacitance C_1 (Fig. 12, App. 83) and upon separation of the body charge from the rug charge a capacitance C_2 develops in place of C_1; these capacitances C_1 and C_2 remain substantially constant upon movement of the body and accordingly no voltage is built up. Repeated comparative tests have borne out this explanation.

Structurally then there is here no reliance on or need for grounding, as is essential to the Ayrton patent, and functionally an entirely different principle is involved, namely, preventing voltage build-up instead of charge removal. It is submitted therefore that there is no equivalency existing, and in this respect alone the Ayrton patent is not a pertinent reference.

As to a capacitative connection alleged to be present in the Ayrton et al patent, there is no basis for the Examiner's suggestion of its existence between the screen 5 and the moving object, for it presumes without warrant a charge on the object and its presence in the vicinity of the screen (supra p. 13). Moreover, as to the *person* creating the charge on the glass by rubbing, he is normally grounded and accordingly is free from any charge; but in the case here under consideration, the person scuffing a rug is charged and retains it, because he is insulated from the ground by the rug. From this, it is evident that the problem of the instant case does not exist in the Ayrton et al patent, and accordingly offers no solution for it.

The Board of Appeals' contention of a "capacitative coupling" between the screen and a charge generated on the front of the *glass,* likewise is of no material moment or relevancy to the issue, which is concerned with the charge on the *person* and not with its elimination but with the prevention of increase in potential differences (supra p. 19).

The conclusion accordingly seems unavoidable that there is no basis for combining the two references on the ground that the alleged capacitative connection of the Ayrton et al patent is equivalent to the direct cord contacts 4 of the British patent. The cords 4 drain a charge 4 from the person; a capacitative connection between charges on the front and rear of the glass has nothing to do with drainage or elimination of a charge from whatever source.

There are, moreover, other differentiations over the art present in the claims. One is the semi-conducting nature of the layer whereby the additional function of avoiding possibility of short circuits is attained. This is obviously not to be found in the Ayrton patent which describes metal or equivalent conductive coatings. Nor is it suggested or present in the British patent that calls for a *conducting* coating and is indicated by the high percentage of carbon particles present; moreover, semiconductivity if present, is accidental, for conductivity and not semi-conductivity is the objective of the patent in dissipating a charge. The claims by this limitation differ in a patentable sense over the cited art.

Further there is the age and nature of the Ayrton patent to be considered. It was granted in 1895 or almost 60 years ago; yet to no one was it apparent that it had any application to rugs or similar structures. The art in 1941 still depended on the interweaving of conductors into rugs as disclosed by the British patent. Obviously that patent is not concerned with the problem of the instant case, nor is there any teaching of the concept upon which the present invention is based. Under such circumstances, it is submitted that it should not be given the status of an anticipation, particularly when doubt exists.

THE LAW AND AUTHORITIES

While appellant had the burden in the District Court of establishing by clear and convincing evidence that the decision of the Patent Office was erroneous, it is submitted that this burden has been met fully. In the recent case of *Standard Oil Development Co.* v. *Marzall*, 84 USPQ 363, 181 F. 2d 280, where there was substantial additional evidence before the District Court not before the Patent Office,

> "We do not give to the decision of the Patent Office the weight to which it would be entitled if its

> rejection of the claims had been made on the same facts as were before the District Court."

The opinion and findings of the District Court, however, give this Court no assistance in the consideration of the highly pertinent and uncontroverted additional evidence presented on behalf of appellant; all that the District Court has to say in its memorandum is that

> "After careful consideration of the record and the testimony adduced at the hearing before the Court, the Court is of the opinion that the claims were properly rejected on the authority of the two patents referred to" (App. 10)

It follows that, if appellant is to have independent judicial consideration of the critically important additional testimony given on his behalf as intended by statute, it must be obtained in this Court; to that end the testimony is analyzed in the preceding portions of this brief but in an endeavor to be concise to avoid extending this brief unduly. It is believed that this Court will find on consideration of the two prior patents relied on by Appellee in the light of the uncontroverted testimony of the witnesses that appellant's structure is not suggested by a combination of these patents.

It is admitted by the District Court and the Board of Appeals that the structure is not to be found in the principal reference, which is the British patent, and the finding rests on no exercise of invention in substituting a "capacitative coupling" from the ancillary Ayrton et al patent for the direct electrical connection to a dissipative coating of the British on the assumption of an equivalency that seems obviously not present. This Court held in the case of *Becket* v. *Coe,* 38 USPQ 26, 98 F. 2d 332, concerned with a foreign patent as a principal reference,

> "With the Becket application before us it is possible to look back upon the—(French) patents and to say

> that they suggested what he found but such hindsight should not, we think, defeat his application";

and quoting the prior decision of *Davies* v. *Coe,* 65 App. D. C. 345, that

> "The disclosure of a foreign patent is to be measured not by what may be made out of it but what is clearly and definitely expressed in it."

How then can an assumed and non-existent equivalency be the basis of making a certainty out of the British patent disclosure?

The District Court for the District of Columbia followed the above practice in the case of *Nye* v. *Coe,* 53 USPQ 663, 44 F. Supp. 582, pointing out that (665)

> "While a simple improvement on a patent would not as a rule, entitle an applicant to a patent on such improvement, an improvement arrived at on a different theory, producing definitely different results and resulting in a superior and more useful instrument, must be held to be the result of inventive genius and is patentable".

These remarks are particularly pertinent, in view of the fact that the invention in issue is built upon an entirely different principle of operation from the British patent and likewise the ancillary Ayrton patent. As stated by this Court in *Hartford-Empire Co.* v. *Coe,* 66 App. D. C. 344; 87 F. 2d 741, quoting from *In re Moulton,* 40 App. D. C. 160:

> "It is not only necessary that the prior patents might have been used to carry out the process, but that such use was either contemplated or would have occurred, in the ordinary mechanical operation of the device."

Then the age of the Ayrton patent, without any effect for about sixty years on the development of the art away from the use of dangerous conductors in the interval, must have some bearing on its weight as a valid reference. This Court has given attention to it, as shown by the following past decisions:

In re Sheffield, 53 App. D. C. 109. It is significant the art should have remained stationary for near half a century. He was concerned with a different problem than the applicant here attempted to meet, and there is no real or substantial identify of disclosure.

In re Foltz, 57 App. D. C. 92. Considering the age of these reference, the very material differences in structure to which we have referred and the apparent fact that the applicant has evolved a new combination productive of a substantially new and useful result, we think the applicant is entitled to a patent.

CONCLUSION

It is earnestly submitted that the additional evidence on behalf of appellant in the District Court establishes beyond reasonable doubt that the decision of the Patent Office in refusing appellant a patent on his invention was clearly erroneous.

This evidence establishes the clear error on the part of the Patent Office tribunals in interpreting and applying the prior art patents; this was not available to the Patent Office tribunals. It also brings the great value of the invention in its simplicity, one that permits the usual rugs, for example, to be used without any modification, and the elimination of hazards through the adoption of the semi-conducting (not present in the cited art) for the element coacting with the rug.

Appellant therefore urges that the judgment of the District Court be revised and reversed.

Respectfully submitted

Joseph N. Nielsen,
Attorney for Appellant.

BRIEF FOR APPELLEE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

APPEAL NO. 11131

THOMAS F. PETERSON, APPELLANT

v.

JOHN A. MARZALL, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

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United States Court of Appea
For the
District of Columbia Circuit
FILED OCT 8 1951
Joseph W. Stewart
CLERK

Appeal No. 11131

STATEMENT OF QUESTION PRESENTED

In the opinion of appellee, the question is whether the District Court was right in upholding the rejection by the Patent Office tribunals of the claims in suit of appellant's application for patent for want of invention over the disclosure of the British patent 541,169 (Joint Appendix pages 78 to 81) on the ground that in view of the teaching of the patent to Ayrton et al. (Joint Appendix pages 75 to 77) it was not a matter of invention to substitute for the conductive connection of the British patent an electrostatic or capacitative connection or coupling as used by the patent to Ayrton et al.

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APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

COUNTERSTATEMENT OF THE CASE

The Patent Office declined to allow claims 21, 22 and 23 (Joint Appendix pages 62, 63) of appellant's application for patent. The reasons for refusal by the examiner are set forth in his statement (Joint Appendix pages 62 to 67). The Board of Appeals affirmed the action of the examiner for the reasons given (Joint Appendix pages 70 to 73) in the decision and in a second decision (Joint Appendix page 74) denying a request for reconsideration as to making any changes in the original decision.

The District Court filed a memorandum opinion (Joint Appendix pages 8 to 11) expressing the opinion that the claims in suit were properly rejected on the authority of the two cited patents. Findings of Fact and Conclusions of Law (Joint Appendix pages 11 and 12) were filed, with a judgment (Joint Appendix page 13) dismissing the complaint.

SUMMARY OF ARGUMENT

1. Neither novelty or usefulness of the alleged invention was in issue in the Patent Office.

2. The presentation before the District Court of evidence of novelty and usefulness of appellant's alleged invention did not change the posture of the case in the District Court.

3. Neither did the presentation before the District Court of evidence of the operating principle of appellant's alleged invention change the posture of the case. It is elementary in patent law that it is method and device which may be patented and not the scientific explanation of their operation.

4. The evidence before the District Court shows that the principal difference between the construction claimed by appellant and that shown by the British patent 541,169 resides in the substitution for the conducting elements 4 thereof of an electrostatic or capacitative coupling.

5. The District Court found as a fact that the difference just mentioned was not a matter of invention in view of the teaching of the patent to Ayrton et al.

6. The foregoing finding of the District Court is a reasonable finding on the evidence before the Court,

so that the finding that the claims at bar lack invention should not be set aside.

ARGUMENT

1. Although it is clear from the very beginning of appellant's brief (Appellant's Statement of Question Presented), as well as from appellant's statement of points relied upon at pages 3 and 4 of his brief, that appellant is relying heavily upon novelty and usefulness of the alleged invention (note also page 3 of appellant's brief, third full paragraph), it is equally clear from the record that neither of these points was in issue before the Patent Office tribunals. Lack of novelty in itself is a proper ground of rejection of a claim, but no such rejection was made. The inference is that novelty was conceded by the Patent Office. Likewise, lack of usefulness in itself is a proper ground upon which to reject a claim. No such rejection was applied in the Patent Office, leaving the inference that usefulness was also conceded.

The sole ground upon which the Patent Office rejected the claims at bar was for want of invention over the prior art. The sole issue before this Court is whether the District Court was right in holding (Joint Appendix page 10) that "the claims were properly rejected on the authority of the two patents referred to."

2. Novelty and usefulness having not been an issue before the Patent Office, the presentation before the District Court of evidence of novelty and usefulness certainly added nothing to the case by way of showing error in the position taken by the tribunals of the

Patent Office. Conceding the novelty and usefulness, there still has to be borne in mind the admonition of the Supreme Court in the case of *Thompson et al.* v. *Boisselier et al.,* 114 U. S. 1, reading as follows:

> So, it is not enough that a thing shall be new, in the sense that in the shape or form in which it is produced, it shall not have been before known, and that it shall be useful, but it must, under the Constitution and the statute, amount to an invention or discovery.

3. Appellant, in the section of his brief beginning at page 15 thereof, relies heavily upon the "operating principle of the invention." The evidence before the District Court as to the operating principle of appellant's device was certainly relevant to assist the Court in understanding the functioning of appellant's device. However, it is not the functioning of appellant's device which may be patented, even though new and useful.

It is elementary in patent law that it is method and device which may be patented and not the scientific explanation of their operation. *De Forest Radio Company* v. *General Electric Company,* 283 U. S. 664.

Appellant at page 15 of his brief, after arguing that the British patent relies upon elimination and dissipation of the electrostatic charges, presents the argument that that is not "the objective or the function of the structure here in controversy," since in appellant's device the charges remain, but are prevented from acquiring too high a voltage so that harmful sparking occurs. Appellant's specification (Joint Appendix page 51) refers to the elimination of sparking by his device, and his brief, at page 6, mentions the same point.

Appellant, in outlining the disclosure of the British patent 541,169 at pages 8 and 9 of his brief omits to state that the patent also mentions as among its objects or purposes (Joint Appendix page 79, lines 46 to 50) the "purpose of eliminating the annoyance of static shock." Appellant also fails to call the attention of the Court to the comparative tests mentioned in the patent (Joint Appendix page 80, lines 94 to 105) where a section of rug not provided with the invention produced "sparks as long as one-half inch," whereas walking over the portion of the rug treated according to the invention gave "no evidence of a static discharge." The complete disclosure of the patent, it is submitted, makes it plain that the ultimate objective of the device there disclosed is not so far different from appellant's expressed objectives as appellant's arguments at first blush might appear to indicate. So far as the claims in suit are concerned, the expressed purpose of the device of appellant is "to prevent substantial increase in the potential between the charges."

Appellant apparently concedes at page 15 of his brief that if there is the difference in function and operation for which he is arguing then such difference can result only "from a difference in structure over the references." The important point for consideration here then of necessity involves the determination of the difference in structure of appellant's device over the references. In view of what has been hereinbefore stated, no further consideration need be given to the scientific explanation of the operation of appellant's device, for it is clear that patentability may not be predicated upon such scientific explanation alone.

4. Coming to the structural difference of appellant's device as set forth in the claims over that of the British patent 541,169 (Joint Appendix pages 78 to 81) it is submitted that there is one, and only one, principal difference which need here be given consideration. That feature relates to the conducting elements 4 of the British patent, provided for conducting the static charges from the surface of the rug to the layer on the back of the rug. Appellant's device has no conducting elements 4.

Although appellant argues at pages 21, 22 and 28 of his brief that there is a difference in his device over the device of the British patent as respects the character of the rubber layer including carbon particles, because appellant uses a different proportion of carbon particles than the British patent, nevertheless it is clear that the claims in suit do not specify any proportions of carbon particles.

While appellant's specification does state the proportion of carbon particles, nevertheless, even if there were invention in appellant's proportions set forth in his specification, it would not aid the claims where the proportions are not set forth in the claims. *Murphy* v. *Coe,* 69 App. D. C. 225, 99 F. 2d 994. The mere statement in the claims of the result of the proportions used, namely, to produce "a layer of semi-conductivity," cannot be taken as a claiming of the particular proportions required to produce that result. *Koebel* v. *Coe,* 70 App. D. C. 261, 105 F. 2d 784, and authorities therein cited.

It is submitted, then, that the principal difference of appellant's device as set forth in the claims over the device of the British patent resides only in the omission in appellant's device of the conducting elements 4 of the British patent. The evidence shows (Joint Appendix page 47, last two questions and answers) that appellant himself reluctantly admitted on cross examination that if the elements 4 were left out of the device of the British patent, in comparing what was left with appellant's device, "I imagine they would be very similar."

Although there are some comments at pages 29 and 30 of appellant's brief as to weight to be given the disclosure in a foreign patent, which comments are correct, nevertheless, little consideration need be given to those comments here, for the reason that appellant has not shown that they are pertinent to the case at bar. It is submitted that the British patent has not been relied upon for any feature which is not clearly disclosed therein.

5. Having pointed out the principal difference of appellant's device as set forth in the claims over the disclosure of the British patent 541,169, it is next to be considered whether the difference amounts to invention in view of the prior art. In this jurisdiction, the question of invention over the prior art is one of fact. *Besser* v. *Ooms,* 81 U. S. App. D. C. 7, 154 F. 2d 17.

The District Court found as a fact, in Findings of Fact 5 and 6 (Joint Appendix page 12), that the difference just mentioned over the disclosure of the British patent was not a matter of invention in view of the teaching of the patent to Ayrton et al. (Joint Appendix pages 75 to 77).

Appellant, at page 30 of his brief, comments on the age of the Ayrton et al. patent and its existence for almost sixty years without any impression on the art along the line of appellant's alleged invention. Authorities of this Court are cited at page 31 of appellant's brief, in an effort to show that the inventive genius of appellant was required to bring to light the device of the claims at bar.

Whatever force there might be to appellant's arguments were all of the references here relied upon sixty years old, it is to be pointed out that the patent to Ayrton et al. is not the basic reference here. It is only a secondary reference, cited to show the use of capacity or electrostatic coupling, rather than mere conductive connection, to dissipate electrostatic charges. The basic reference here relied upon as being nearest to appellant's claimed device is the British patent.

The record shows (Joint Appendix page 79) that this British patent was not accepted until November 14, 1941. The record also shows (Joint Appendix page 8) that appellant's application here involved was filed on November 13, 1943. On the facts of the case at bar, there is accordingly not the long lapse after the appearance before the public of the disclosure of the British patent and the production of appellant's alleged improvement thereover, which might be relied upon in support of the argument that the alleged improvement was not obvious to the skilled worker in the art, but required the inventive genius of the appellant to envision such improvement.

6. It is submitted that the foregoing finding of fact

as to lack of invention over the prior art is a reasonable finding on the evidence before the District Court. Appellant's additional evidence, not presented to the Patent Office tribunals, is submitted not to alter the reasonableness of the finding of the District Court as to lack of invention over the prior art. Under such circumstances, the finding that the claims at bar lack invention should not be set aside. *Besser* v. *Ooms, supra,* and long list of authorities cited therein under footnote 3.

CONCLUSION

In consequence it is therefore respectfully submitted that the judgment from which appeal has been taken is correct and should be affirmed.

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